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SESSIONAL PAPERS

VOL. XLVII.—PART V.

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FIRST SESSION

OF THE

FOURTEENTH LEGISLATURE

OF THE

PROVINCE OF ONTARIO

SESSION 1915

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1915

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No. 24 Report upon the Feeble-minded of the Province for the year 1914. Presented to the Legislature, April 2nd, 1915. *Printed.*

No. 25 Report upon the Hospitals and Charities of the Province for the year 1914. Presented to the Legislature, April 2nd, 1915. *Printed.*

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No. 27 Report on the neglected and dependent Children in the Province for the year 1914. Presented to the Legislature, March 29th, 1915. *Printed.*

No. 28 Report upon the operation of the Liquor License Acts in the Province during the year 1914. Presented to the Legislature, February 23rd, 1915. *Printed.*

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No. 31 Report of the Ontario Veterinary College for the year 1914. Presented to the Legislature, April 2nd, 1915. *Printed.*

No. 32 Report of the Agricultural and Experimental Union for the year 1914. Presented to the Legislature, April 2nd, 1915. *Printed.*

No. 33 Report of the Corn Growers' Association for the year 1914. Presented to the Legislature, April 2nd, 1915. *Printed.*

No. 34 Report of the Ontario Vegetable Growers' Association for the year 1914. Presented to the Legislature, April 2nd, 1915. *Printed.*

No. 35 Report of the Bee-Keepers' Association for the year 1914. Presented to the Legislature, April 2nd, 1915. *Printed.*

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No. 44 Report of the Fruit Growers' Association for the year 1914. Presented to the Legislature, April 2nd, 1915. *Printed.*

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No. 52 Report of the Librarian on the State of the Library. Presented to the Legislature, February 24th, 1915. *Not Printed.*

No. 53 Provincial Auditor's Statements for the year 1913-14. Presented to the Legislature, February 25th, 1915. *Printed.*

No. 54 Report of the Workmen's Compensation Board, Ontario, for the year ending 31st December, 1914. Presented to the Legislature, February 22nd, 1915. *Printed for distribution.*

No. 55 Copies of Orders-in-Council under subsection 6 of section 78, Cap. 62, R.S.O. 1914, relating to Surrogate Courts. Presented to the Legislature, February 23rd, 1915. *Not Printed.*

No. 56 Copies of Orders-in-Council and Regulations made under the authority of the Department of Education or of the Acts relating to Public, Separate or High Schools. Presented to the Legislature, February 23rd, 1915. *Printed for distribution.*

No. 57 Rules and Regulations made under chap. 24, R.S.O. 1914 as amended by Cap. 10, 4 Geo. V., relating to Succession Duties. Presented to the Legislature, February 25th, 1915. *Printed for distribution.*

No. 58 Whitson's Report of Northern Development Branch under 2 Geo. V., Cap. 2, for the year 1914. Presented to the Legislature, March 18th, 1915. *Printed.*

No. 59 Return to an Order of the House of the 22nd February, 1915, for a Return showing:—If any part of the 32,000 acres now being cleared, or about to be cleared, by the Government in the vicinity of Sudbury is to be set apart or used to give work to the unemployed. How many acres are to be so set aside, and what are the terms and conditions upon which the unemployed can secure work. Presented to the Legislature, March 8th, 1915. Mr. *Carter. Not Printed.*

No. 60 Report of the Honourable Mr. Justice Riddell, as representative of the Province of Ontario at the Ceremonies in the City of New Orleans held in Commemoration of the one hundredth anniversary of the Battle of New Orleans and of the one hundred years of peace which began with the end of that Battle. Presented to the Legislature, March 15th, 1915. *Printed.*

No. 61 Report of the Commissioner appointed to enquire into the financial affairs of the Village of Weston. Presented to the Legislature, March 15th, 1915. *Not Printed.*

No. 62 Return to an Order of the House of the 15th March, 1915, for a Return showing:—1. All correspondence between the Government or any officer or official thereof and Paul Morand, License Inspector for North Essex, in reference to the resignation or dismissal in the month of April, 1914, of the said Paul Morand as License Inspector for North Essex. 2. All correspondence and communications between the Government or any officer or official thereof and the said Paul Morand and any resident or residents of North Essex with reference to the re-appointment of the said Paul Morand as License Inspector in North Essex in the month of June, 1914, a few days before the election. Presented to the Legislature, March 15th, 1915. Mr. *Ducharme. Not Printed.*

No. 63 Agreement and Contract with Litho-Print, Limited, in connection with the Binding, etc., for the several Departments of Government. Presented to the Legislature, March 23rd, 1915. *Printed.*

No. 64 Return to an Order of the House of the 10th March, 1915, for a Return showing:—1. Copies of all petitions or requests received by the Government since the 1st day of January, 1914, from any Municipal Authority or Body in the Province in reference to the imposition of a tax upon automobiles, or as to the distribution of that tax or a portion thereof to the municipalities maintaining the roads. 2. Copies of all correspondence between the Government and any officer or official thereof and any Municipality of the Province, or any Automobile Association or Organization in reference to the said matter. Presented to the Legislature, March 17th, 1915. Mr. *Racine. Not Printed.*

No. 65 Return to an Address to His Honour the Lieutenant-Governor of the 11th March, 1915, for a Return of:—1. Copies of all Orders-in-Council and correspondence between the Government and any officer or official thereof and the Timiskaming and Northern Ontario Railway Company and any officer or official thereof in reference to the retirement of Frederick Dane as one of the Commissioners of the said Railway. 2. Copies of all Orders-in-Council and correspondence between the Government and

any officer or official thereof and the Timiskaming and Northern Ontario Railway Company with reference to the appointment of Mr. Lee as one of the Commissioners of the said Railway. Presented to the Legislature, March 19th, 1915. Mr. *Mageau. Not Printed.*

No. 66 Return to an Order of the House of the 15th March, 1915, for a Return showing:—1. What officers have been appointed by the Workmen's Compensation Board under section 59 of the Workmen's Compensation Act. 2. What are the names, dates of appointment, and salaries of each officer so appointed. Presented to the Legislature, March 18th, 1915. Mr. *Carter. Not Printed.*

No. 67 Return to an Order of the House of 3rd March, 1915, for a Return showing:—1. All statements furnished by the Canada Copper Company, the International Nickel Company, the Mond Nickel Company and any other companies producing nickel, under section 8 of the Mining Tax Act respecting Taxation. 2. All reports from any Government mining assessor, made under the provisions of the Mining Taxation Act in respect of the mining operations of the Canada Copper Company, the International Nickel Company or the Mond Nickel Company, and particularly with reference to the royalties or taxes to be paid by the said Companies. 3. All correspondence between the Minister of Lands, Forests and Mines, or the Provincial Treasurer, or any officer or official of the Government and the Canada Copper Company, the International Nickel Company, the Mond Nickel Company and any other Companies producing nickel, with reference to the amount of royalties or taxes paid by the said Companies, or any of them, to the Provincial Treasury of the Province in respect of the ore mined or the mining operations carried on by them in the Province of Ontario. Presented to the Legislature, March 18th, 1915. Mr. *Carter. Not Printed.*

No. 68 Proceedings of the Second Annual Convention of the Association of Cemetery Officials of Canada. Presented to the Legislature, March 26th, 1915. *Not Printed.*

No. 69 Return to an Address of the 23rd day of March, 1915, praying for a Return shewing: 1. Copy of Order-in-Council dated 14th day of February, 1871, appropriating and transferring to the Government of the Province of Ontario the lands and property known as The Ontario Government House. 2. Copy of the Letters Patent dated the 15th day of January, 1908, declaring the said lands to have been transferred and appropriated for the use of the Provincial Legislature of the Province of Ontario within the meaning of the British North America Act, 1867. Presented to the Legislature 26th March, 1915. Mr. *Bowman. Not Printed.*

No. 70 Return to an Order of the House of the 25th March, 1915, for a Return showing:—1. How many convictions for violation of the Liquor License Law have been made for the electoral district for North Essex since the re-appointment of Paul Morand as License Inspector at the end of May, 1914. 2. Have Provincial officers or detectives been sent into this district since the 1st of June, 1914, to assist in securing enforcement of the law. 3. How many prosecutions have been instituted by, or at the instance of Provincial officers or detectives, and the said Paul Morand, respectively. Presented to the Legislature, March 29th, 1915. Mr. *Richardson. Not Printed.*

No. 71 Special Report on the Organization and Administration of the Hospitals for the Insane, Feeble-Minded and Epileptics and District Industrial Farms of the Province. Presented to the Legislature, March 29th, 1915. *Printed for distribution only.*

No. 72 Return to an Order of the House of the 24th March, 1915, for a Return showing:—1. What is the total number of the herd for dairy purposes now maintained by the Government at the Guelph Prison Farm. 2. How many of these were purchased and how many raised on the farm, respectively. 3. What was the total amount paid by the Government for the portion of the herd purchased by them. Presented to the Legislature, 31st March, 1915. Mr. *Ham. Not Printed.*

No. 73 Financial Statement of the Treasurer of Ontario. Presented to the Legislature, April 2nd, 1915. *Printed for distribution only.*

No. 74 Return to an Order of the House of 31st March, 1915, for a Return showing:—1. The number of English-French schools which have complied in the year 1914 with Regulation 17 of the Department of Education passed in the year 1913. 2. The number of English-French schools which have not complied with said Regulation 17 in the year 1914. 3. What English-French schools have received grants in the year 1914 under the Public Schools Act, and the amount thereof. 4. Copy of joint reports, if any, made by any inspectors pursuant to Regulation 17 and dated on or about May 23rd, 1913. 5. Copy of letters exchanged between ex-Inspector Henri Saint Jacques and the Department of Education or any officer or officers thereof with reference to the resignation of the said Henri Saint Jacques which are dated on or about the 18th October, 1913, and the 23rd October, 1913. Presented to the Legislature, April 2nd, 1915. Mr. *Mageau. Not Printed.*

No. 75 Return to an Order of the House of the 17th March, 1915, for a Return showing:—1. How many timber berths or locations have been sold since the 1st day of January, 1914. 2. Were all such berths or locations advertised for sale; if not, which ones were sold without advertisement. 3. If any were sold without

being advertised for sale, who were the purchasers, and what are the prices realized and the dates of the sales, respectively. 4. In what papers were the different timber berths or locations respectively advertised for sale, and what were the dates of such advertisements respectively. 5. What is the period for which they were so advertised in the said papers, respectively. Presented to the Legislature, April 2nd, 1915. Mr. *Munro. Not Printed.*

No. 76 Telephone Systems, specifications, etc., as *per* Report of Ontario Railway and Municipal Board. Presented to the Legislature, April 2nd, 1915. *Printed.*

No. 77 Return to an Order of the House of the 28th April, 1914, for a Return showing:—1. If the Government granted the right to cut Pine or any other timber to Messrs. Foley Bros., Contractors, or to the Northern Construction Company, Limited, or to any person, firm or company in connection with the construction of the Canadian Northern Railway Company in the vicinity of Duchesne Lake, situate about 90 miles from the Town of Sudbury. 2. If so, to what persons, firms or companies were such permits made, and the dates of each. 3. What consideration did the Government receive with respect to each of the said permits, if any. 4. What Pine or other timber has been cut to date by each of the persons, firms or companies with respect to such permits. 5. How long was the right to cut to last and over what extent of land; and what were the other terms or conditions upon which such permits were made, if any. 6. What was the date of the completion of the construction of the Canadian Northern Railway at this point. 7. What amount of timber has been cut by any person, firm or company to whom such permit, as mentioned, has been made. 8. Is any person, firm or company at the present time cutting timber pursuant to such permit. Presented to the Legislature, April 2nd, 1915. Mr. *Richardson. Not Printed.*

No. 78 Return to an Order of the House of the 27th March, 1914, for a Return of:—All correspondence with reference to the resignation of Mr. Harkness, Manager, Superintendent of the Jordan Experimental Station. 2. The reports of the Committee or Advisory Board of the said farm for the years 1911, 1912 and 1913. 3. Statements showing the total expenditure to date divided between cost of building, cost of land, improvements of land and cost of management. Presented to the Legislature, April 2nd, 1915. Mr. *Anderson (Bruce.) Not Printed.*

No. 79 Return to an Order of the House of the 7th April. 1914, for a Return showing:—1. If the Lieutenant-Governor in Council made any arrangements under section 9 of the Succession Duties Act, with any part of the British Dominions, or with any

foreign country; and if so, with what Provinces or countries. 2. If no such arrangement has been made with the Province of Quebec, does the Honourable the Provincial Treasurer make an allowance with respect to Succession Duties in Ontario with respect to shares of stock of a bank or other financial institution whose head office is in the Province of Quebec. 3. If it is true that a Succession Duty is payable with respect to such shares, both in Quebec and Ontario, will legislation be introduced to protect estates from payment of double duty. Presented to the Legislature, April 2nd, 1915. Mr. *Marshall. Not Printed.*

No. 80 Return to an Order of the House of the 27th April, 1914, for a Return showing:—1. What consideration was paid by the licensee to the Government in respect of the issue of the original licenses respectively, of the territory included within the proposed agreement with the Pembroke Lumber Company. 2. How much was paid by the Pembroke Lumber Company for these licenses respectively at the date of the purchase thereof by them. 3. What amounts of pine, hemlock, cedar, spruce, hardwood and other timber respectively have been cut on the limits or areas covered by the proposed agreement and returned to the Department as so cut by the Pembroke Lumber Company in each of the years since the purchase thereof by them. Presented to the Legislature, April 2nd, 1915. Mr. *Bowman. Not Printed.*

No. 81 Statement on the distribution of the Revised and Sessional Statutes, up to 31st December, 1914. Presented to the Legislature, April 2nd, 1915. *Not Printed.*

REPORT

OF THE

Minister of Public Works

FOR THE

PROVINCE OF ONTARIO

FOR THE

TWELVE MONTHS ENDING 31st OCTOBER

1914

PRINTED BY ORDER OF

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To His Honour, John Strathearn Hendrie, C.V.O., a Colonel in the Militia of Canada, etc., etc., etc., Lieutenant-Governor of the Province of Ontario.

Sir,—I have the honour to submit to you, as required by Statute, the Annual Report on the works under the control of the Public Works Department, comprising the Reports of the Deputy Minister, the Architect, the Engineers, the Superintendent and the Accountant of the Colonization Roads Branch, the Chief Inspector of Boilers, and the Accountant and Law Clerk, for the twelve months ending the 31st of October, 1914.

I have the honour to be, Sir,

Your obedient servant,

F. G. Macdiarmid,

Minister of Public Works.

Department of Public Works, Ontario.

March 8th, 1915.

REPORT

OF THE

Deputy Minister of Public Works

Toronto, March 4th, 1915.

HONOURABLE F. G. MACDIARMID, *Minister of Public Works, Ontario.*

SIR,—I have the honour to transmit the reports of the Provincial Architect, Provincial Engineer, Chief Inspector of Steam Boiler Branch, Superintendent and Accountant of the Colonization Roads Branch, and the Accountant and Law Clerk of the Department of Public Works, for the fiscal year ending October 31st, 1914. The following is a brief synopsis of the work carried out during the year.

In the interests of Agriculture, a Field Husbandry Building, New Dining Hall, Commodious Dairy and Poultry Buildings were completed at the Ontario Agricultural College, Guelph. The Ontario Veterinary College building was completed and equipped in the most modern manner. It is situated on University Avenue, in the city of Toronto, and is a handsome building befitting the site. In the interest of education, separate new dormitory buildings for boys and girls were provided at the Ontario School for the Deaf, Belleville, and the Ontario School for the Blind, Brantford; these buildings are two stories in height, semi-fireproof, and the pupils are now perfectly safe from danger of fire. Fine and commodious Court House buildings were completed at Fort Frances, Rainy River District, and at Haileybury, Temiskaming District. A Registry Office building was also completed at Haileybury. Good progress has been made on the New Government House, and New Provincial Reformatory, Guelph, and the Hospital for Insane, Whitby. Several large additional buildings are under construction at the Hospital for Insane, Brockville, Hospital for Insane, London, and Hospital for Idiots, Orillia.

The operation of the "Steam Boilers Act," which has been in force for sixteen months, has given satisfaction to the manufacturers and purchasers of both new and second hand boilers. During the year 478 new boilers have been inspected throughout the process of construction, and 342 used boilers which were being exchanged or undergoing repairs. Of the latter 12 were refused admission to the Province, 16 were condemned, in the case of 170 the pressure allowed to be carried was reduced. Such inspection cannot fail to result in greater safety to life and property.

Highway improvement in Old Ontario has proceeded with increased vigour and comprehensive surveys have been conducted by the Highway Branch along the lines recommended by the Public Roads and Highways Commission. The Public Works Department, through the Provincial Engineer and Superintendent of Colonization Road, have constructed 460 miles of new roads, improved 1,590 miles of old roads and constructed upwards of 60 bridges in the settlements of New Ontario. Permanent masonry dams have been constructed to control the waters of the Muskoka Lakes. Navigation has been improved by dredging and removing

sunken logs from the rivers and lakes in Muskoka and Parry Sound Districts. Drainage works have been carried out in the unorganized districts and assistance given to twelve large drainage schemes in older Ontario.

Full details of the above works will be found in the reports of the officers in charge. The statement of the Accountant and Law Clerk gives the capital expenditure on Public Buildings, Public Works, Colonization Roads, Good Roads (Highway Improvement), Railways, etc., and of contracts and bonds entered into in connection therewith during the twelve months ending the 31st of October, 1914.

I have the honour to be,

Sir,

Your obedient servant,

R. P. Fairbairn,

Deputy Minister of Public Works.

REPORT OF ARCHITECT.

Hon. F. G. Macdiarmid, *Minister of Public Works.*

Sir,—I have the honour to report on the work carried on by the Architect's Branch of your Department for the past twelve months, including the works completed and works under construction.

Government House.

A large amount of work has been done to the residence throughout the past year. All of the firepoofing and electric wiring was completed early in the season. The plumbing and heating and ventilating plants are completed, with the exception of the placing of some of the fixtures. The plastering of the basement, servants' wing, and the two upper stories of the main building, has been completed, the basement having been done by Thos. Gander & Son and the other work by Messrs. Hoidge & Sons, all under contract.

The interior finish (woodwork) of the servants' wing and the rooms on the first and second floors of the main building, is nearly completed, the work being done by Geo. E. Lindsay, of Toronto, also under contract.

Contracts have been awarded this year as follows: To the Hoidge Marble Co., Limited, for marble work in the main halls and stir cases in connection therewith, the marble being obtained from their quarries near Bancroft, in the County of Hastings, in this Province. To the Italian Mosaic & Tile Co. for marble and terrazzo floors. To Messrs. W. J. Trick Co., of Oshawa, for the interior wood finish of the first floor, halls, and corridors of the main building and ball-room, good progress is being made with this work. To W. J. Hynes Co. for plastering and Caen cement work of the first floor and the halls and corridors throughout the main building and ball-room, good progress is also being made with this work. To Mr. John Stewart for painting the woodwork of the first floor, and halls and corridors throughout the main building, including the ball-room. The Canadian Ornamental Iron Works Co. for iron work of private staircase and bronze work of staircases and balconies to upper gallery of main hall and balconies to ball-room. The T. Eaton Co. for tiling the walls and floors of bathrooms and lavatories throughout the building and walls and floors of kitchen, servery, scullery and cold storage room. Good progress is being made with all of the above work. For hardware for servant's wing, the Vokes Hardware Co. and for hardware for the main building the T. Eaton Co. A contract was also awarded to the Canadian Otis Fensom Elevator Co. for an electric passenger elevator, which is now being installed. Considerable work has been done on the grounds, including grading, drainage, etc., all of which will be completed next season. Repairs have been made to the temporary residence and outbuildings, St. George and College Streets, and proper attention given to the grounds.

Parliament Buildings.

The buildings generally have been kept in good repair, fittings and furnishings supplied as required. The grounds, walks and roads have been kept in good condition. Temporary offices have been provided for the Workmen's Compensation Board in the members' smoking-rooms, which have been suitably fitted up for the purpose.

Osgoode Hall.

The buildings have been kept, as usual, in good condition, repairs were made as found to be necessary, including renewing of the galvanized iron roof over the main library and painting in offices.

Hospitals for the Insane.

Satisfactory progress has been made with the various works on the building being erected for a Reception Hospital and Nurses' Home in connection with the Hospital for Insane, Brockville. Plans and specifications for hot water heating and ventilating plants were prepared by Messrs. McMullen, Riley & Durley, heating and ventilating engineers, the work has been satisfactorily carried out under their supervision, by contractors, Purdy Mansell, of Toronto, the plumbing work was also done under contract by these contractors. The contract for electric wiring was awarded to Messrs. A. G. Dobbie & Co., of Brockville. Contracts were also awarded to the Turnbull Elevator Co., of Toronto, for an electric passenger elevator of ample dimensions to accommodate a stretcher to allow patients to be taken from the wards to the operating-room. To the Roelofson Elevator Co., of Galt, for two electric dumb waiters from the kitchen to the upper floors. To the T. Eaton Co. for tiling the walls and floors of the operating-room, bathrooms and lavatories.

This building will be completed by the end of the year and will be the most up-to-date in design and equipment of its kind in the Province.

The farmhouse on the Stag Farm property, recently purchased by the Government, has been remodelled and enlarged and suitable quarters provided for 25 patients (farm hands). The farmer will also reside in the building, separate apartments having been provided for him. A hot water heating apparatus and up-to-date plumbing have been installed, the work being done under contract by Ross & Co., of Brockville. All other work was done mostly by institution labor, with the exception of the plastering, which was carried out by G. L. Barclay, contractor, of Brockville. The building is nearly completed.

The structural work on the cottage for male patients being erected on the grounds of the Hospital for Feeble-minded, Orillia, is progressing favorably, the brick work is finished and the building roofed in. On account of the severe weather in that part of the country, it is deemed advisable to close down the work during the winter months. Proper precautions will be taken to protect the building from damage by frost, the work being resumed as soon as the weather permits. The work in connection with the superstructure of this building is being done by the Provincial Secretary's Department, utilizing patient labor as far as possible, all materials being purchased by that Department, and using bricks for interior work and lime from the Government's plants at Mimico and Guelph respectively. All mill work, including door and window frames, door sashes and trim being made at the Provincial Reformatory, Guelph. The work is being done under the supervision of this Department and when completed will be a credit to both Departments.

Plans and specifications have been made for another cottage to be erected on the grounds of this institution, for female patients, similar to the building above referred to, work to start on same early in the season. To provide steam to heat the new buildings, additional boilers will have to be installed, which will necessitate

the remodelling of the boiler-house and boiler plant. Preliminary sketches are now being prepared for this work.

The remodelling of the sewage plant at the Hospital for Insane, Kingston, has been completed and is working satisfactorily.

The construction of the Amusement Hall at the Hospital for Insane, London, is progressing satisfactorily, the brick work is completed and the building roofed in. On the approach of severe frost the work will be shut down during the winter months.

Plans and specifications were made for an inexpensive building to be erected on the grounds of the Hospital for Epileptics, Woodstock, to fill the requirements of a work shop and a recreation hall. Good progress is being made with the work.

Both of these buildings are being erected by the Provincial Secretary's Department under the supervision of the Department of Public Works, on the same conditions as the buildings at Orillia.

Ontario School for the Deaf, Belleville.

The girls' dormitory (or residence for girls) was completed and fully equipped, has been occupied for some time. The dormitory for boys has also been completed and ready for occupancy. The buildings were formally opened by the Honorable the Premier and the Honorable the Minister of Education, on October 16th.

The alterations to boiler-house and laundry and the remodelling of the steam plant have been completed and additional radiation placed in workshops as required.

A fire hall has been erected conveniently located to the various buildings on the grounds, and the contracts were awarded to Thos. Manley & Sons, Belleville, for general trades, and Purdy Mansell, Limited, for steam heating. Cement side walks were laid in front of the main building, extending therefrom to the boys' dormitory. The work was done under contract by Thos. Manley & Sons.

Repairs have been made to the various buildings as found necessary from time to time, including plumbing and heating appliances.

Ontario School for Blind, Brantford.

The dormitory building for girls has been completed, equipped, and occupied for some time. The dormitory for boys is nearing completion and will be ready to receive the pupils by the first of the year. The remodelling of the boiler-house and boiler plant has been fully completed.

Considerable repairs were made to the bursar's house, which were necessary to make the place habitable, including a hot water heating apparatus and new plumbing. Repairs to the buildings generally have been attended to, including the laying of a tile floor in the main entrance hall on the ground floor of the main building, replacing a wood floor. The work was done under contract by the Italian Mosaic & Tile Co., of Toronto. New doors and frames have also been placed to the main entrance, replacing those worn out. Cement walks have been laid from the main building to the boys' dormitory.

Normal and Model Schools.

Repairs have been made to the buildings as required and the equipment kept in good condition in the Normal and Model Schools, Ottawa, Toronto, Hamilton, Stratford, Peterborough, and North Bay, and the grounds, walks, and roads to same have been kept in good order. Repairs have also been attended to at the English and French Training School in Sandwich.

Ontario Veterinary College.

The contracts for this building were all completed, with the exception of some minor details, for the opening of the college on October 1st. Further contracts were awarded this year, including iron and mastic staircases to the Canadian Ornamental Iron Co.; terrazzo and tile flooring to the Italian Mosaic & Tile Co.; electric elevator to the Otis Fensom Elevator Co.; fireproof windows to the A. B. Ormsby Co., all of Toronto, and the electric light fixtures to the T. Eaton Co. Tenders were also received for the equipment of the building and awarded as follows: For laboratory tables, lockers, seats and blackboards, the Berlin Interior Hardwood Co., of Berlin; for library and post office fittings, the Canadian Office & School Furniture Co., of Preston; for seating of the lecture rooms on the second and third floors and the seating of the Assembly Hall, G. M. Hendry & Co., of Toronto. For the erection of platforms and galleries in the lecture rooms in basement, second and third floors, including seating of lecture room in the basement, Mr. T. V. Gearing. Metal lockers for cloak-rooms, the Page Wire Fence Co., of Walkerville, and for plumbing in connection with the laboratory tables, Purdy Mansell, Limited.

This building, which is fully described in my Annual Report for 1912, is one of the most satisfactory and interesting that has been erected by your Department, in plan, construction and equipment.

Ontario Agricultural College, Guelph.

The Field Husbandry Building was fully completed and equipped and ready for the opening on January 1st. Contracts were awarded for seating to the Geo. Mundell Co., of Elora; tables, etc., from the Robert Stewart Co., Limited, of Guelph.

The new Dining Hall Building was completed early in the year, and has been in use since February 15th. Equipment for same was purchased by tender, as follows:—Kitchen equipment, Gurney Foundry Co.; Northern Aluminum Co.; Geo. Sparrow & Co., of Toronto; the John Watson Mfg. Co., of Ayr; plumbing, Stevenson & Malcolm, of Guelph; Dominion Linens Limited, of Guelph, and Boeckh Bros., of Toronto. An electric freight elevator has been installed by the Roelofson Elevator Works, of Galt, and the electric light fixtures by R. A. L. Gray, of Toronto.

The Poultry Building was completed, equipped and ready for the opening on January 1st. All of these buildings were fully described in my Annual Report for 1913.

Plans and specifications have been prepared for Dormitory Building, or residence for the maids employed in the dining hall, to be located conveniently to that building. The erection of same is deferred until next year.

This building will be four stories in height, the foundations will be built of concrete to grade line, the superstructure will be of brickwork, faced with red tapestry bricks and the roof covered with red tile, both brick and tile will be made by the Ontario Government Brick & Tile Works. The basement contains a large sitting room opening on to a verandah, sewing room, laundry, and boiler room. The ground floor is divided into apartments for the Dietitian, including sitting room, bedroom, bathroom, private hall and entrance, five double bedrooms and one single bedroom and toilet and bathrooms for the maids. An amply wide corridor with a stairway at each end leading to the upper floors extends through the centre of and the full length of the building with entrance halls from the front connecting with same. The first floor gives accommodation for eight double bedrooms, a large room for the sick, with separate toilet and bathrooms, all properly isolated. The second floor gives accommodation for nine double bedrooms and one single bedroom, toilet and bathrooms are also provided for on both of these floors. A closet is provided for each maid opening from the bedroom.

The heating will be done by steam from the Main Boiler Plant. Due attention has been paid to the ventilation and sanitary arrangements and every provision made, in an economic way, for the comfort of the servants who will occupy the building.

Plans and specifications have been made for the Physics Building, which will be located on the east side of the Campus, adjoining the Biological Building, and, externally, is designed to harmonize with that building. It will be four stories in height, including the basement, with a frontage facing west of 101 ft. 9 in. by a depth of 70 ft. The foundations will be built of concrete, the superstructure of outside walls brick faced with red pressed bricks, the basement walls to plinth being faced with Credit Valley rock faced stone. The main entrance doorway, or portico, the plinth, stone courses, sills, etc., are of Credit Valley dressed stone. The roof will be covered with blue slates. The interior walls will be built of terra cotta, the floors being supported on steel posts and beams. The building has been planned to meet the requirements of the faculty. The basement will be used entirely for heating and ventilating apparatus and storage. The first and second floors are divided into large class rooms, laboratory class and laboratory rooms, professor's rooms, demonstrator's rooms, draftsman's rooms, offices, store rooms, and private laboratories. Ample provision has been made for toilet and cloak rooms on the different floors. A wide hall extending up through the building is located on the centre of the building with a stairway at the west end and an electric freight elevator at the east end, the main entrance being from the front. This building will also be heated by steam from the central boiler plant. An up-to-date heating and ventilating system will be installed.

Both of these buildings will be erected by the Provincial Secretary's Department under the supervision of the Department of Public Works, all plans, specifications and detail drawings being made by the Department of Public Works.

DISTRICTS.

Kenora.

Repairs have been made to the Court House, jail and jailer's house, Kenora, a new fence has been erected enclosing the jail yard; the work was done by the prisoners.

Timiskaming.

The Registry Office in Haileybury was completed early in the year and furniture supplied. The Court House in Haileybury is completed and furnishings for court room and offices will be completed next month; these were purchased by tender from the Canadian Office & School Furniture Co., Preston.

The Court House at Fort Frances was completed, furnished, and occupied in September. The furnishings were purchased by tender from the Berlin Interior Hardwood Co., of Berlin. Contracts were awarded, in addition to those awarded last year, to Purdy Mansell, Limited, for heating and plumbing, etc., and the Pearson Electric Co., Fort Frances, for electric wiring and fixtures.

An addition was built to the gaol at Fort Frances, the work being done under contract by East & Corrin of that place, and the heating by Purdy, Mansell, Limited, of Toronto.

Considerable repairs were made to the Court House and Gaol in North Bay, including the painting of outside of Court House and Judges' Chambers.

Repairs have been made to the other court houses, gaols and lock-ups in the judicial districts throughout the province.

Inspections.

The buildings under the Department throughout the Province, including the buildings under construction, are inspected from time to time, as may be necessary, by the architect, assistant architect, and staff.

The inspection of boilers in the provincial institutions, formerly under the Boiler Inspection Branch, is now being attended to by Mr. W. H. Bradt, who has been appointed Inspector of Boilers to fill the position made vacant by the appointment of Mr. D. M. Medcalf as Chief Inspector of the Boiler Inspection Branch of the Department. Mr. Bradt also inspects the machinery and steam plants in connection with the Government Buildings.

The inspection of repairs to buildings is attended to by Mr. S. J. Spall, General Clerk of Works, who also checks all accounts in connection with the various contracts and purchase of materials. The electrical work, including installations and repairs, is looked after by Mr. F. G. Stroud, Chief Electrician of the Department.

I have the honour to be,

Sir,

Your obedient servant,

F. R. Heakes.

Architect.

Department of Public Works, Ontario.

Toronto, November 13th, 1914.

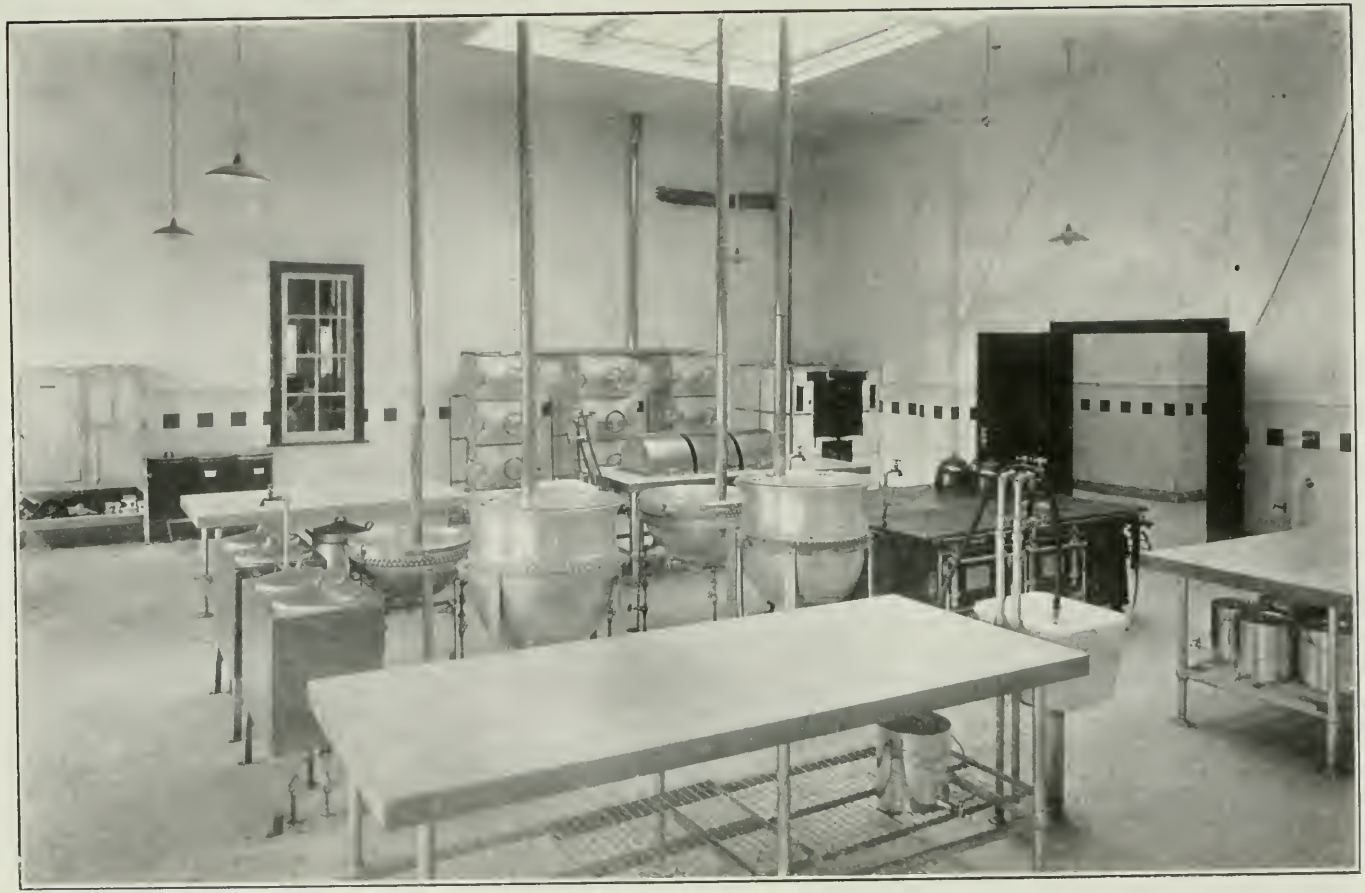
Hospital for the Insane, Brockville. Reception Hospital.

Ontario Agricultural College, Guelph. Field Husbandry Building.

Ontario Agricultural College, Guelph. Physics Building.

Ontario Agricultural College, Guelph. New Dining Hall.

Ontario Agricultural College, Guelph. New Dining Hall.



Ontario Agricultural College, Guelph. New Dining Hall—Kitchen.

Ontario Veterinary College, Toronto, University Avenue and Anderson Street.

Ontario Veterinary College, Toronto. One of Four Chemical Laboratories.

Ontario Veterinary College, Toronto. Anatomical Laboratory.
Note.—Incinerator in rear. Horses enter from Elevator A.

Ontario Veterinary College, Toronto. Stable in Basement, North Side.

Ontario Veterinary College, Toronto. Stable in Basement, South Side.

Court House and Registry Office, Haileybury, Temiskaming District.

REPORT OF ENGINEER.

Honourable F. G. Macdiarmid, Esq.,
Minister of Public Works.

Sir,—I have the honour to report on the works carried on by the Engineers' Branch of the Ontario Public Works Department during the year ending October 31st, A.D. 1914.

The fiscal year ending on October 31st as usual found us with a number of Public Works, chiefly bridges, under construction. Work was continued on these while the favourable weather lasted. All concrete work was suspended when freezing weather set in.

The practice of constructing works by day labour under our regular staff of foremen was continued during the past season. All material, steel, cement, timber, etc., is purchased by the Department by public tender. Plans for the different works are prepared in the Department and the work of construction is carried out under the direct supervision of our engineering staff.

Sixteen steel bridges on stone and concrete abutments and three steel bridges on timber pile abutments were erected during the year. Forty-four wooden bridges for which special appropriations were made were constructed and opened to traffic. The most important of the steel bridges erected are the Casey Brethour bridge over the White River, consisting of three spans of seventy feet each, and the Marter Townline bridge, also over the White River, consisting of one span one hundred and fifty feet long.

In the interests of internal navigation the stone and concrete dam in the south channel of the outlet of Muskoka Lake at Bala was completed and put in operation. The old wooden structure was entirely removed. A new stone and concrete dam in the outlet of Mary's Lake at Port Sydney was constructed. This dam will provide for the proper regulation of the water in Mary's Lake and should have a material effect on power plants on the Muskoka River, insuring a more regular and lasting flow of water. The Pickerel dams at the outlet of Dollar Lake in the Parry Sound District were completed. The level of Dollar Lake was raised about eight feet. The high water floods the rapids at the foot of Wilson Lake, opening up navigation from Loring to the dams, a distance of about thirty miles. Captain Walton has placed the steamer *Kawigamog* on these waters to operate between Lost Bay, a port about seven miles from the Canadian Northern Railway, and Loring, the most important settlement in the district. This section of the country is one of the most picturesque in the Highlands of Ontario and this new route for tourists must prove most attractive to lovers of natural and wild scenery.

An entire new equipment of machinery was purchased from Beatty & Sons, of Hamilton, at a cost of $4,100.00 for the Government dredge. The machinery was installed in a new hull constructed by the Department by day labour. We now have a dredge in first class order that insures many years of good service. The dredge was operated the greater part of the season in the Bracebridge River, removing sand bars and cutting new channels. During the latter part of the season the dredge was operated for six weeks by the Federal Works Department, in removing rock from the Narrows near Gravenhurst.

The construction of drainage works in the new districts "for the drainage of roads" was continued, about $23,000.00 being expended in providing outlets for road drainage. The colonization road grants are not sufficient in many cases to provide proper outlets where these outlets have to be carried any considerable distance. It is on this class of outlet on which this money is expended.

Work on the plant at Mount Pleasant, for the propagation of bass, was continued during the past summer. Pond No. 6 was completed and will be put to use next spring. A new concrete block building 80 ft. by 26 ft. and a storey and a half high was constructed during the summer by day labour. The building is to be used as a trout hatchery. When in operation this hatchery will be equipped to handle about 3,000,000 of trout spawn per season. Work has been started on the concrete ponds for the rearing of the young trout. We fully expect to have these ponds in operation in time to take care of the young trout from next spring hatch. The success of this hatchery, which we confidently look forward to, should have an important bearing on the future stock of game fish in Ontario. These hatcheries are easily constructed and comparatively inexpensive to operate, and a few of them distributed about the country should enable us, in a few years, to restock the streams that once made Ontario the "Anglers' Paradise."

The work of repainting steel bridges was continued. The Kaministikwia bridge, Paipoonge Township, left unpainted by the contractors, was painted by the Department. The old swing bridge at Indian Point on Manitoulin Island was repainted. The old steel from Garden River, which was removed to Alton's bridge and erected by the Department was also repainted. The only steel bridges remaining unpainted are the three bridges lately erected over the White River in Temiskaming. These we expect to paint during the coming summer.

Two steel bridges for which grants were voted were inspected and the grants paid to the municipalities which carried out the work. Twelve large drainage schemes constructed under the "Municipal Drainage Act," for which aid was voted at the last session of Parliament, were inspected and reported on, and the grants were paid to the interested municipalities.

The sum of $30,000.00 was voted for maintenance of locks, dams, bridges, dredging, etc. The sum of $5,045.00 was expended in outfitting and operating the dredge; $3,428.00 was spent on repairs to locks, dams and swing bridges. On other bridges the work of repair embraced some sixty-five different structures. The demand on this repair fund becomes more urgent from year to year. All the old timber bridges constructed some twelve to fifteen years ago are now giving out. It is a difficult matter to keep them in shape for traffic. Good timber is very hard to secure and any class of timber is now very expensive. It has become a matter of necessity to replace these old timber structures with steel bridges on concrete abutments. In order to accomplish this desirable end the amount of money heretofore appropriated for this purpose should be largely increased.

Algoma District Bridges.

Ansonia Bridge, Lefroy.—Located over the Big Thessalon River on the Bruce Road, Sec. 14, Township of Lefroy. It comprises an 80 ft. steel span on heavy concrete abutments. As the bottom is soft the abutments are supported on piles, 62 piles being used in each foundation. The steel superstructure was

supplied by the Hamilton Bridge Works at a cost of $1,143.00 and was erected by the Department under the supervision of J. W. Hackner, an engineer of the Department. Owing to the late erection of the steel the concrete floor was not laid. A temporary floor was placed on the bridge to accommodate public travel, until the concrete floor may be safely put on.

Bar River Bridges, Laird and McDonald.—This work comprises the renewing of three timber bridges in the Township of McDonald, two on Section 25 and one on Section 23. The bridges are 26 feet long, supported on pile abutments, covering three inch plank. The approaches are filled with stone and gravel. Cost of three bridges, $540.00.

Black Creek Bridge, Salter.—Located over a small creek on the Trunk Road, Section 31, Salter. It is a 24 ft. steel beam span supported on concrete abutments 12 ft. high. The steel beams, railing, etc., were supplied by the Hamilton Bridge Works Co., at a cost of $325.08. The work was done under the supervision of S. W. Butt, foreman of Public Works. The full cost of the bridges was $2,126.00.

Boda Creek Bridge, Shakespeare.—Located on the north-west corner of Lot 1, Concession 6, Shakespeare. It is a pile timber bridge 83 ft. long with a centre span 35 ft. wide. An A truss spans the centre opening. The truss is supported by double pile bents. The stringers are 8 in. flatted timbers and the flooring is of three inch plank. The work was done by S. W. Butt at a cost of $390.00.

Dean Lake and Thompson Road Bridge.—Located over a small creek on the south-east quarter of Section 9, in Thompson Township. It comprises a 12 ft. steel beam span supported by concrete abutments resting on a timber grillage. The work was done by S. W. Butt. The cost of the bridge complete was $1,000.00.

Finley Bridge, Echo River.—Located over the Echo River on Section 8, McDonald Township. The work consisted of raising the old bridge 5 ft. to allow for the passage of timber scows. The raising of the bridge necessitated the building up of the approaches on a 5 per cent. grade. The approaches were filled with stone and gravel. The work was carried out under the supervision of S. Cole, Road Inspector, at a cost of $773.00.

Great Northern Road Bridge, Plummer.—Located on Block A in Plummer Township on the Great Northern Road near Ottertail Lake. It is a concrete culvert 20 ft. long and 4 ft. in clear width. The fill for the roadway is of stone and gravel. The work was done under the supervision of S. Cole at a total cost of $362.75.

Houles Bridge, Salter.—Located over a small creek on the Trunk Road south-east quarter Sec. 27, Township of Salter. It comprises a 12 ft. steel beam span supported on concrete abutments. As the bottom is soft the abutments rest on a timber grillage which extends across the stream under both abutments. The steel beams, railing, etc., were supplied by the Hamilton Bridge Works Co., and the work was done under the supervision of S. W. Butt. The cost of the bridge complete was $1,366.00.

Lee Valley Bridge, LaCloche Creek.—Located over LaCloche Creek in Concession 1 on the boundary between the Townships of May and Hallam. It

comprises a steel beam span 41 ft. 4 in. long, face to face of abutments. The roadway has a clear width of 14 ft. The main outside girders of 24 in., I-beams 80 pounds per foot, strengthened with 7 in. plates 5/8 in. thick on top and bottom; two 18 in. floor beams support 5 lines of 9 in. steel joist. The railing consists of three lines of galvanized pipe. The floor is a 6 in. concrete slab. The abutments are of concrete 6¾ ft. wide at the bottom and 14 ft. high. As the bottom is soft the abutments and wing walls are supported on piles driven at 3 ft. centres. On the north-east corner a wing wall of concrete 30 ft. long has been placed to protect the roadway from the action of the current. The steel superstructure was supplied by the Hamilton Bridge Co., at a cost of $570.62. The work was done and the steel placed under the supervision of S. W. Butt at a cost of $2,272.68; making the entire cost of the structure $2,843.30. The bridge has been opened to traffic.

Little Serpent Bridge, Victoria.—Located over the Little Serpent River on the Trunk Road, south-east quarter Sec. 18, Township of Victoria. It is a timber bridge 160 ft. long. The old structure was entirely removed down to the water-line. The piers and abutments were rebuilt to a height of 4 ft. 3 in. above the old level. The cover is of 2 in. pine plank and the stringers are of 8 in. flatted pine. The grading was completed to the new level. The work was done under the supervision of S. Cole, Road Inspector. The bridge complete cost $390.13.

Rates Bridge, Thessalon River.—Located over the Thessalon River on Lot 3, Concession 3, Aberdeen. It comprises a 70 ft. steel span on concrete abutments. The steel has been delivered but the work on the abutments has not been completed owing to a delay in starting the work due to the money stringency. The bridge will not be completed until next summer. A temporary bridge has been provided to accommodate public travel until the new bridge is completed.

Rose and Plummer Bridges.—Located on small water courses on the boundary between Rose and Plummer. They are two bridges concrete arches 28 ft. long, 4 ft. by 4 ft. inside measurement. The work was done under the supervision of S. Cole, Road Inspector, at a cost of $497.00.

Soo District Bridges.

Big Carp Bridge.—Located over the Big Carp River on the line between Sections 6 and 7 in the Township of Awenge. The over all length of the bridge is 87 ft. The substructure consists of 5 pile bents with five piles to a bent. The two middle openings are 28½ ft. each and the end spans are 15 ft. each. The middle openings are covered with five lines of 10 in. steel joist. The end spans are covered with 6 lines of timber stringers. The flooring is of 3 in. plank. The approaches are well graded and substantial handrail is provided on each side over the full length. The bridge was constructed by the Township of Awenge, the Department giving a grant of $700.00 towards the cost of construction. The bridge is fully completed.

Root River Bridge, Tarentorus Township.—Located over the Root River on the 6th line of Tarentorus at the deviation on Sec. 4. It is a steel beam bridge on concrete abutments. The outside girders are 24 in. I-beams with two 15 in. floor beams. There are five lines of 8 in. steel joist. The floor slab is of concrete

6 in. thick reinforced with steelcrete floor mesh. The work was done under the direction of W. H. Munro. The grading of the approaches will not be completed until next spring, at which season the work may be done to the best advantage.

Fort William District.

O'Connor Township Bridges.—No. 1. Located on line between Lots 4 and 5 in the 5th Concession, over Cedar Creek. Length 30 ft., height 3ft. above high water, width 14 ft., 5 flatted stringers, cover, 3 in. tamarac plank. The supports are framed bents resting on mud sills bedded below the bottom of the stream. No. 2. A timber bridge of the same size and description as the above bridges, located over Cedar Creek, on Lot 4, on the line between Concessions 3 and 4. These bridges cost $200.00 each. No. 3. A timber bridge located over the Whitefish River on Lot 5, Concession 2. The bridge is 80 ft. long, with a truss span 50 ft. long and an approach span 30 ft. long on the east end. The roadway is 14 ft. wide; the floor of the bridge is 8 ft. above the water level. The cost of the bridge was $500.00.

Pearson Township Bridges.—No. 1. Located over the East Branch of Pine River on the line between Lots 9 and 10, Concession 2. It is 30 ft. long, supported by a king truss. The end supports are framed bents resting on mud-sills bedded below the bottom of the stream. The height of the bridge is 8 ft. —3 feet above high water level. On the south end is a fill 100 ft. long, averaging 4 ft. in height, and on the north end is a fill 10 ft. long and 4 ft. high. No. 2. Is a timber bridge across Pine River on the line between Lots 11 and 12, in the 3rd Concession. It is a queen truss 50 ft. long, 14 ft. roadway, supported on framed bents. The truss members are all 12 in. by 12 in. timbers, and the stringers and flooring are flatted tamarac. At the south end is a fill 150 ft. long averaging 6 ft. in height.

Gillies Township Bridge.—A timber bridge located over the Whitefish River on Lot 10, Concession 4. It comprises a truss span 50 ft. long and an approach span 18 ft. long, supported on framed bents. The width is 14 ft. and the height 8 ft. above low water, and three feet above high water. The cost, including the grading of approaches, was $500.00.

Kenora District Bridges.

Black Sturgeon Bridge, Mellick.—A timber pile trestle 290 ft. long, located over the Second Narrows in Black Sturgeon Lake, Lot 2, Concession 1, in the Township of Mellick, a short distance above the old bridge site. The bents are of 5 piles each and are driven at 16 foot centres. The floor system comprises 6 lines of 8 in. flatted jack pine with a floor of 4 in. flatted tamarac. A substantial guard rail is supplied. The bottom is of boulders and gravel. The floor of the bridge is 10 ft. above water level and well above high water mark. The bridge cost $940.00 complete, which amounts to $3.25 per lineal foot.

Wabigoon Bridge, Eaton Township.—This is a pile trestle 144 ft. long consisting of 9 spans 16 ft. centre to centre. Owing to the very soft nature of the bottom the piles had to be spliced, being driven from 65 to 75 ft. deep. Five spiles were used in each bent. The outside lines of stringers are 6 in. by 12 in.

and the 4 middle lines of stringers are 3 in. by 12 in. tamarac plank. A substantial railing is supplied. The floor of the bridge is 9 ft. above ordinary water level, and well above the high water limit. The cost of the bridge complete was $1,186.00.

Wabigoon Bridge, Quibell.—This bridge is located over the Wabigoon River at the Townsite of Quibell, on Lot 6, Concession 5, Wabigoon Township. The bridge is a pile trestle 428 ft. long built 15 ft. 6 in. above ordinary water level. The pile bents are placed at 15 ft. centre, 5 piles being used in each bent. A substantial railing of 4 in. by 4 in. tamarac is supplied. The stringers are of 3 in. by 12 in. pine, and the covering is 3 in. Norway pine plank.

Shallow Lake Bridge.—This bridge is located over a narrow arm of Shallow Lake near the line between the north and south halves of Lot 6 in Concession 4 in the Township of Wabigoon. This bridge is 280 ft. long. It is a pile trestle, the pile bents being driven at 16 foot centres. Five piles are placed in each bent. The flooring and stringers are of 3 inch sawn timber. A substantial railing is provided. These two bridges cost complete $3,200.00, which amounts to $4.50 per lineal foot.

Rainy River Bridges.

Sturgeon Bridge, Mather-Dobie Townline.—Located over Sturgeon Creek on the Mather-Dobie Townline. The bridge is 22 ft. long, 14 ft. roadway, 7 lines of flatted stringers; cover, 3 inch plank. The approaches are raised to a height of 3½ ft.—250 ft. on west end and 150 ft. on east end. The entire work cost $358.00.

Lockington Bridge.—Located over a small stream on the river road on Lot 6 in the Township of Lash. This bridge is in a wide, deep ravine, which was crossed by a long timber trestle. A new timber pile trestle 80 ft. long replaced the old structure, the balance of the ravine, some 217 ft., being filled to a height of 16 ft., the height of the timber trestle. The fill is allowed to fall to a natural slope around the outside pile bents. The timber trestle comprises 6 bents of 4 piles each, the bents being placed at 16 foot centres. The covering consists of 3 inch tamarac plank supported on 6 lines of 8 inch flatted stringers. A substantial guard railing is supplied on bridge and fill. The hills on each side of the ravine were cut down to ease the grades and supply material for filling. The entire cost of the work was $2,182.00.

Sudbury District Bridges.

Waters 5th Concession Bridge.—A steel beam bridge on rubble masonry abutments, located over Kelly Creek on Lot 2 in the 5th Concession of Waters Township. The bottom of the stream, hard boulders and gravel. The abutments are rubble masonry built on stone-filled cribs. The floor system, 30 ft. long and 14 ft. wide, consists of two outside steel beams 24 inches deep with an 18 in. floor beam midway between the abutments; 5 lines of 9 in. steel joist together with the two outside beams support a 6 in. concrete floor. The guard railing is of galvanized pipe; posts of angle irons. The approaches to each end of the bridge are rock filled. The steel superstructure supplied by the Hamilton Bridge

Company, cost $325.00. The work of constructing the abutments, placing the steel and filling the approaches was done by day labour at a cost of $1,411.00, making the full cost of the bridge $1,736.00.

Creighton-Vermilion Bridge.—Located on the upper crossing of the Vermilion River on the townline between Creighton and Fairbanks. It consists of a scow ferry operated on a steel cable. The cost of the ferry complete was $397.00.

Manitoulin Bridges.

A timber bridge was rebuilt on the Vincer Road East in front of Lots 19 and 20, Concession 3, Carnarvon. The bridge is 22 ft. long. Heavy fills of earth and stone were put in at each end of the bridge. The complete work cost $390.00.

10th Sideroad Bridge, Campbell.—One hundred and five dollars was spent in repairing this bridge, renewing the covering and building up the approaches.

5th Sideroad Bridge, Campbell.—This bridge, located on Lots 5 and 6, Con. 11, was rebuilt. The abutments are of stone and the covering is timber. The bridge was raised above the old level and the approaches properly graded to correspond with the new elevation. The complete work cost $250,00.

9th Concession Bridge, Campbell.—The covering of this bridge was renewed and the approaches properly graded. The work cost $51.00.

Sturgeon Falls District Bridges.

Sturgeon Falls Town Bridge.—The big bridge over the Sturgeon River in the Town of Sturgeon Falls commenced in 1913, was completed and opened to traffic in the spring of 1914. The total cost of this bridge was $18,741.51.

Sylvestre Bridge, Kirkpatrick.—Located on the townline between Kirkpatrick and McPherson, at the line between Lots 1 and 2. At this point the Sylvestre Creek forms an elbow, crossing the line of the road in two places a short distance apart. The bow in the creek extends but a few feet south of the line of the road. A high ledge of rock necessitated the building of two bridges across the creek at this point. These bridges required to be renewed. On investigation it was found that the road could be opened through the rocks at far less expense than would be required to renew the two bridges. The ledge of rock was removed by blasting, a proper roadway provided and a guard rail erected. The entire cost of the work was $725.00.

Wolsley Bridge, Guys Hill.—A timber bridge over Wolsley Creek, in the township of Martland. It is supplied with a Queen truss, span 50 ft. long, supported on timber abutments. The full cost of the work was $993.12.

Timiskaming District Bridges.

Baptiste Creek Bridge, 3rd Con. Armstrong.—A timber bridge on pile piers situate over the Jean Baptiste Creek, on Lot 10 on the 3rd Concession line of Armstrong. The centre channel span supported by a King truss is 28 ft. long, pile trestle approaches 14 ft. long are placed at each end, giving an overall

length of 54 ft. The bridge floor is 15½ ft. above normal water level. The timber used is a good quality of tamarac. The fills at each end are 60 ft. long, 20 ft. wide on top, and average 6 ft. in height. The cost of the work complete was $465.00.

Beauchamp Townline Bridges.—This work consisted of renewing three bridges in the 1st and 2nd Concessions on the townline between Beauchamp and Armstrong. One bridge, 24 ft. long, was entirely renewed. The other bridges, 40 and 35 ft. long, were re-covered, flooring and stringers. Grading to the amount of 2,900 cu. yards was done, properly constructing the approaches. The full cost of the work was $598.17.

Casey-Brethour Townline Bridge.—This bridge is situate over LaBlanche River, on the townline between the townships of Casey and Brethour, the direct, line from Thornloe Station to the east Provincial boundary. The bridge is 268 ft. long. It comprises three steel spans 70 ft. long, with timber trestle approaches 48 ft. long on west end and 32 ft. long on east end. The supporting piers are timber piles. To provide for navigation the bridge has a clear height of 23 ft. above the ordinary summer level. Owing to the extreme height of the bridge, which is about 25 ft. above the bottom of the river, frame bents 16 ft. high are built up from the tops of the two middle piers. Twenty-one piles are placed in each pier. Cribs of round timber are built around each pier. These cribs are well supplied with cross ties and are drift-bolted. The cribs are built up to low water level and filled with stone. The steel for the three spans was supplied by the Hamilton Bridge Works Co., and cost $2,030.00 f.o.b. New Liskeard. All the work in connection with the bridge was done by day labour under the direction of C. R. Dolmage. He also erected the steel. The full cost of the bridge was $7,717.00.

Fifth Concession Bridge, Wabi-Dymond.—Situated over the Wabis Creek on the line between the 5th and 6th Concessions, Township of Dymond. The bridge is 182 ft. long overall. It consists of a timber truss 60 ft. long, with pile trestle approaches 53 ft. long on east end and 69 ft. long on west end. The bridge has a clear height of 12 ft. above high water level. The bridge was built by day labour under the direction of W. E. Kerr, on plans, etc., supplied by the Department. The entire cost of the bridge was $1,710.00.

Tomstown Bridge Repairs.—This work consisted of placing a new wheel track of 2 in. plank 8 ft. long over the entire length of the floor of the Tomstown bridge over the LaBlanche River. The bridge is 314 ft. long. The full cost of the work was $400.00.

Nipissing District Bridges.

Chippewa Creek Bridges, Widdifield.—Two permanent bridges were built over the Chippewa Creek on the Temiskaming Road, a short distance from the Town of North Bay. Both bridges are located on Lot 19, Concession B., Widdifield. They are built on the same plan. They consist of six lines of 12 in. I-beams, resting on concrete abutments. The abutments are built on solid rock and are about 6 ft. in height to the bridge seats. The floor is a 6 in. concrete slab reinforced with 3.9.30 steelcrete mesh. Galvanized pipe handrails are supplied on each bridge. The entire cost of the two bridges, including the necessary grading, was $1,848.00.

Omo Creek Bridge, Cameron.—Situate on the Pembroke-Mattawa Road about two and one-half miles east of Klock, a station on the C. P. Ry. The bridge is a concrete trestle with a roadway 14 ft. in clear width. It is 86 ft. 6 in. long, and consists of three spans, one span of 34 ft. and two of 26 ft. 3in. each. The abutments and wing walls have a full height of 17 ft. 6 in. to floor level and are 6 ft. 6 in. wide at the base. The middle piers are 4 ft. 6 in. wide at the base and are built up solid for a height of 12 ft. The floor system consists of a 6 in. slab reinforced with steel bars, which is supported by four lines of concrete beams reinforced with twisted steel bars. On the main span the two middle beams are 17 in. wide and the outside beams 15 in. wide. The beams are all 36 in. deep below the floor. On the two shorter spans the two middle beams are 16 in. wide and the outside beams are 14 in. wide. The beams are all 24 in. deep below the bottom of the floor. For a guard-rail three lines of galvanized pipe are supported by concrete posts built up from the floor curb at a distance of 8 ft. 6 in. centre to centre. The approaches to the bridge were properly graded and gravelled.

The entire cost of the bridge, which was done under the direction of J. W. Hackner, an Engineer of this Department, was $2,924.

Sampson's Bridge.—This bridge over Kabuska Creek near Bonfield was constructed last year. Owing to the late construction the concrete floor was not laid, a temporary floor being provided to take care of the traffic. This spring, as soon as weather conditions permitted, the concrete floor was laid and the approaches properly graded. The amount expended this year was $325.

Parry Sound District Bridges.

McKellar Village Bridge.—Located over a branch of the Seguin River on the Dunchurch-Parry Sound Road, in the Township of McKellar. The bridge replaces a long, worn out timber structure. It comprises seven lines of 12 in. I-beams 18 ft. long supporting a 6 in. floor slab. The abutments are concrete resting on solid bed rock. The height of the abutments is 12 ft. A heavy fill was placed at each end of the bridge. The bridge is supplied with a substantial guard railing consisting of three lines of galvanized pipe supported by angle iron posts. The full cost of the bridge was $942.28.

Seguin River Bridge, Christie.—This bridge is located over the Seguin River on Lot 17, Concession 12, Christie. It comprises a 45 ft. steel beam span on concrete abutments. The main outside beams are 24 in. deep and strengthened with 5/8 in. cover plates 7 in. wide. Two 18 in. floor beams support five lines of 9 in. steel joist. The floor is a 6 in. slab of concrete reinforced with steelcrete floor mesh. The railing comprises three lines of galvanized pipe supported by 4 in. x 4 in. angle iron posts. The abutments, which are 14 ft. high to the floor level, rest on piles—37 piles being used under each abutment. The steel was supplied by the Hamilton Bridge Works, Co., at a cost of $577. The steel was placed and riveted up by the Department's foreman. The bridge, including the necessary grading, cost, complete, $1,956.00.

Sand Lake Bridge, Proudfoot.—Located over the Magnetawan River on the line between Lots 9 and 10, in the First Concession of Proudfoot. The work was started in 1913; it comprises one centre span of 34 ft., and two spans of 26 ft. each. The piers are of concrete piles, and the floor system of steel beams and floor joists. On the 34 ft. centre span, the outside beams are 24 in. deep, and on

the 26 ft. spans the outside beams are 18 in. deep. A single floor beam 18 in. deep is used in each span to support five lines of 8 in. floor joist. The floor slab of concrete is 6 in. thick, and is reinforced with steelcrete floor mesh. The railing consists of these lines of galvanized pipe supported by 4 x 4 angle iron posts. A heavy fill is placed at each end of the bridge. The entire cost of the bridge, including the necessary grading, was $3,318.81.

Pickerel River Improvements.—The work on Pickerel River navigation route between Loring and Dollars Dam was continued. The work on the dams at the outlet of Dollar Lake was completed. The highway bridge over the stream near Wilson's Rapids was raised about 10 ft. to provide head room for the small steamer. The water level in Dollar Lake was raised about 8 ft., sufficient to provide a navigable channel through Wilson's Rapids. The steamboat is now operating on the route from Loring to Lost Bay. The cost of the work, apart from the raising of the bridges, was $4,114.50.

Muskoka District Bridges.

Dee Bank Bridge.—Located over a creek at Dee Bank on the Windermere Road in the Township of Watt—it comprises two steel beam spans of 40 ft. each, giving clear spans of 37 ft. 9 in. The outside beams are 24 in. deep, two floor beams 15 in. deep, and five lines of 8 in. steel joist. The floor is a 6 in. slab of concrete reinforced. The centre pier and abutments are about 15 ft. in height and are supported on pile foundations. The pier and abutments are of rubble masonry set in cement mortar. The steel superstructure was supplied by the Hamilton Bridge Works Co., at a cost of $816.64. The cost of the bridge complete was $2,697.

Muskoka Road Bridge, Koshee Creek.—Located over Koshee Creek on the Grant Road, Lot 16, in the Township of Morrison. It consists of a 36 ft. steel beam span on rubble masonry abutments. The outside beams are 24 in. deep, with two floor beams 15 in. deep. The floor beams support five lines of 8 in. steel joist. The floor is a 6 inch concrete slab reinforced with steelcrete floor mesh. The abutments are 24 ft. 6 in. in height to the bridge seat. The fill is about 20 ft. high at each end of the bridge. The entire cost of the bridge and grading was $2,775.

Peninsula Canal Bridge.—Located over the navigable canal between Peninsula Lake and Fairy Lake in the Huntsville waters. The bridge is a steel trestle 210 ft. long, comprising a central truss span over the channel 60 ft. long, and six spans of 25 ft. each. The truss and floor system are supported on steel bents resting on concrete bases. Small concrete abutments or bridge seats are supplied at each end. The concrete bases are supported on pile foundations. The steel work was supplied by the Hamilton Bridge Works, Co., at a cost of $3,124.11. The steel was erected by the foreman who prepared the concrete bases. The concrete floor will not be laid until next spring, but a temporary floor will be provided for the winter. The old bridge will be dismantled and any timber fit for use will be used in repair work at the Locks.

Port Sydney Dam.—This Dam, which replaces the old timber dam, is located immediately below the site of the old dam at the outlet of Mary's Lake on the north branch of Muskoka River. The present summer level is 922.15 above sea level. The new dam will safely provide for a height of 924.99. On the old gauge

still in use the zero mark corresponds to an elevation of 921.49. The summer or navigation level is fixed at 8 in. above zero on the gauge, corresponding to an elevation of 922.15. The dam consists of seven stop-log openings, 20 ft. in clear width. The fixed sills are set at different levels. Three are set at an elevation of 917.24, three at 916.24 and one at 915.24, requiring in all 40 stop-logs 12 x 12 —20 ft. long, to hold the water at navigation level. The piers are of rubble masonry set in cement mortar. The piers and sills are bedded in the solid rock bottom and well grouted with cement mortar. The piers are 20 ft. long and 5 ft. wide and 12 ft. high. The stop-log chaces are of steel, being built up with two 10 in. channels and a 5/16 inch plate 24 inches wide. The top is covered throughout with a platform 16 ft. wide. The platform is of 3 in. plank supported by five lines of 8 in. I-beams. A substantial handrail is supplied on the downstream side of the platform and 4 in. x 4 in. x ⅜ in. T. posts support three lines of galvanized pipe. Alternate posts are embedded in the piers, while the intermediate posts are riveted to the steel beams. The outside piers are supplied with wing walls which are carried out to solid rock banks on each side, at the same elevation as the top of the piers.

A new track on which to operate the stop-log winches was placed on the platform. The old dam was entirely removed on the completion of the new structure. Severe frost prevented the full completion of the concrete work, but a few days' work will complete the tops of the piers and the proper grouting of the handrail posts. The work was done by day labor under the direction of Wm. Lowe, the pay lists, board bill, etc., amounting to $3,453.82. The steel beams, chaces, handrail, etc., were supplied by the Hamilton Bridge Works Co. The entire cost of the steel, hardware, etc., was $1,382.45. The cement cost $595; lumber, stop-logs, etc., $1,096.18; explosives, $247.05; making the cost to date $7,049. The appropriation for the work was $7,500.00.

East Simcoe Bridges.

Hog Creek Bridge, 6th Concession, Tay.—Located over Hog Creek on Lot No. 8, on the road between the 5th and 6th Concession. It is a steel beam bridge on concrete abutments. The floor system consists of six lines of 12 in. I-beams 22 ft. long, giving a waterway 18 ft. 10 in. wide. The floor slab is of concrete 6 in. thick. The railing consists of three lines of galvanized pipe supported by posts of 4 in. x 4 in. angles. The concrete abutments rest on a cross laid timber grillage laid well below the bed of the stream. The abutments are 12 ft. high, and are supplied with wing walls at each end to hold the fill. The steel was supplied by the Hamilton Bridge Works Co., at a cost of $149.15. The abutments were constructed, the steel placed, the floor laid and the necessary grading completed by day labor under the direction of Amos Train. The total cost of the bridge was $1,787.78.

North River, 4th Concession Bridge, North Orillia.—Located over the North River opposite Lot No. 4, on the line between the 3rd and 4th Concessions. It is of girder beam construction. The girders are 18 in. I-beams with a 15 in. floor beam. Five lines of 8 in. steel joist are placed to support a six inch floor slab. The railing consists of three lines of galvanized pipe supported by four posts of 4 in. x 4 in. angles. The concrete abutments and wings are supported on a timber grillage laid well below the bottom of the stream. The abutments are 11½ ft. high to the floor level. The steel was supplied by the Hamilton Bridge Works Co., at a cost of $236.56. The work was done by day labour under the direction of Amos Train. The full cost of the bridge was $1,650.00.

North Victoria Bridges.

Cardiff Monmouth Townline Bridge.—Located over a creek on the Townline a short distance north of Wilberforce. The old bridge was 364 ft. long; 329 ft. of this waterway has been filled leaving a waterway 35 ft. in width. The fill is 14 ft. wide on top, and is from 4 to 10½ ft. high. Material for the fill was taken from a gravel hill at the north end of the bridge. Material was secured from the old structure to thoroughly repair the portion of the bridge remaining. The work cost $863.78.

Dunsfords Bridge, Verulam.—The Township of Verulam replaced a long wooden structure over Sherriff's Creek, on Lot 4 in the 2nd Concession, with a concrete arch bridge 20 ft. long; 160 ft. of the space occupied by the old bridge was filled in, a permanent work resulting. On a report of the proper completion of the work at a cost of $472.84 the grant of $200 voted in aid of the work was paid to the Township of Verulam.

Poverty Lake Bridge, Monmouth.—Located over a creek at the outlet of Poverty Lake. It consists of a small bridge 12 ft. long and a fill 250 ft. long—14 ft. wide on top, of an average height of 5½ ft. A substantial handrail was placed at each side of the fill. $406.11 was expended on the work.

North Hastings Bridges.

Bangor, Bells Rapids Bridge.—Located over a creek on Lot 10, Concession 13, Bangor. It is a timber bridge 32 ft. long. The abutments are cedar cribs stone filled. $150.00 was expended on the work.

Wicklow Gull Creek Bridge.—Located on Lot 6, Concession 7, Wicklow. Two spans 23 ft. and 16 ft. have been provided. The pier and abutments are cedar timber cribs 8 ft. wide, 16 ft. long, 10 ft. high, stone filled. The stringers and covering are flatted cedar. The approaches are stone-filled with a gravelled surface. $250.00 was expended on the work.

Carlow, Papineau Creek Bridge.—Located over Papineau Creek on Lot 6 in the 13th Concession of Carlow. The bridge has four spans of 21 ft. Five cedar cribs 12 x 14 and 16 ft. high, all stone filled. The stringers and covering are flatted cedar. Approaches have been built up 72 ft. on the south end and 61 ft. on the north end. $794.88 was expended on the work.

White's Bridge, Mayo.—Located over Mississippi Creek on Lot 21 in the 15th Concession. The abutments are cedar cribs filled with stone to the water line. A 33 ft. waterway is provided. The stringers are flatted cedar and the floor is of 6 x 6 sawn cedar. The approaches are built up of stone, with a gravelled roadway provided. The bridge cost $291.73.

Addington-Frontenac Bridges.

Clark's Bridge, Kennebec.—Located over the Salmon River on Lot 16, Concession 7, Kennebec, on the Arden-Kaladar Road. The length of the bridge is 79 ft. It consists of rubble masonry piers built up from the stone filled cribs. The covering is of flatted cedar. The approaches 88 ft. in length and from 6 to 18 ft. high, and are stone-filled. A guard rail built of cedar is placed at each side of the bridge and fill. The work complete cost $631.60.

Clyde River Bridge, South Canoto.—Located over the River Clyde on Lot 26, Concession 3, about midway between Canoto and Folger Station. The old structure was 60 ft. long. The new bridge is 18 ft. long. The east pier is a solid rock ledge 8 ft. high. The west pier is built up of rock, and is also 8 ft. high. The fill on the west end is 22 rods long and 4 ft. high. It is built of stone and covered with gravel. $499.00 was spent on the work.

Swamp Creek Bridge, Clarendon.—Located over Swamp Creek, Lot 31, Frontenac Road. The bridge has a clear span 17 ft. long. It is covered with flatted cedar resting on rubble stone abutments 8 ft. high. The stone is laid up with cement mortar. The approaches to the bridge are rock-filled and covered with gravel. $188.70 was expended on the work.

Mud Creek Bridge, Portland.—The Township of Portland constructed a permanent bridge over Mud Creek on Lot No. 4, Concession 1, on the old Portland Road leading from Kingston to Harrowsmith. The old bridge was a long timber structure on stone-filled cribs. The new bridge is a steel beam span 14 ft. 10 in. long resting on concrete abutments. The abutments are supported on a timber grillage. On a report of the proper completion of the bridge the appropriation of $1,000 was paid to the Township of Portland.

Renfrew Bridges.

Algona Bonnechere Bridge.—Located over the Bonnechere River at the outlet of Golden Lake. The bridge is a concrete and steel structure 137 ft. long. It is comprised of four girder beam spans 34 ft. long. The outside or girder beams are 24 in. deep. 18 in. floor beams are placed in each span supporting five lines of 10 in. steel floor joist. The floor slab is of concrete 6 in. thick reinforced with steelcrete floor mesh. The railing consists of three lines of galvanized pipe supported by posts of 4 x 4 angles placed at 8½ ft. centres. The piers and abutments are of concrete set on a hard bottom of boulders and gravel. The piers and abutments average about 14 ft. in height. The cost of the bridge complete was $4,752.23. Of this amount the County of Renfrew contributed $1,000. As the bridge is on the boundary of an Indian Reserve the Department of Indian Affairs also contributed $1,000, making the cost to the Province $2,752.23.

Black Donald Bridge, Brougham.—Located over the Black Donald Creek at Lot 23 in the 3rd Concession of Brougham. The bridge is 50 ft. long. It is built on three cedar timber cribs 16 ft. long, 8 ft. wide and 10 ft. high, stone-filled. The stringers, five in number, are of flatted cedar. The cover is also of flatted cedar. The west approach, 100 yds. long, is 18 ft. wide on top and of an average height of 3 ft. The work complete cost $314.00.

Ninth Concession Bridge, Admaston.—Located on Lot 25 in the 9th Concession. The old bridge was about 300 ft. long. This has been shortened up to 16 ft. and a substantial cedar bridge constructed. The site of the old bridge has been filled with stone and a proper lasting roadway provided. The work complete cost $400.00.

Radcliffe Bridge.—Located over a creek on Lot 26, Concession 2, Radcliffe, on the Jewellville Road. The bridge is 75 ft. long, built on 3 cedar timber cribs, stone-filled. The stringers and cover are flatted cedar. A smaller bridge over the same creek and on the same road is located on Lot 23 in the 19th Concession of Raglan. This bridge is 25 ft. long and is built on cedar cribs. The stringers and floor are of flatted cedar. The full cost of the two bridges was $400.

Breakwater at Union, South Essex.

A breakwater was constructed on the Lake Erie shore at the Tubercular Sanitarium at Union on the Lake in South Essex. The work consists of a timber crib breakwater, stone-filled to protect the high banks from the action of the waves. The cribs are eight feet wide, outside measurement, and about five feet in height. They are built of 10 x 10 pine timbers, well drift-bolted and cross tied. The cribs are filled to the top with field stone. Behind the crib the level of the ground has been raised to prevent the passage of water during storms. Three hundred and fifty-five feet in length was constructed at a cost of $2,453. The work was done by day labour under the direction of Alex Tourangeau, of Windsor.

Maintenance of Locks, Dams, Bridges, Dredging, Etc.

During the year the following works were carried out under the direction of the Superintendent of Public Works in the interest of internal navigation.

The dredge worked the greater part of the season in and near the Bracebridge River. A new navigable channel called the Alport Cut was opened from the River into Mud Lake. At present the River has two outlets. The southern outlet is largely used as a booming ground by the lumber companies. The new cut which has been dredged out over a length of 900 ft. will give another entrance to the River from the south, materially shortening the distance between Gravenhurst and Bracebridge. A number of sand bars at sharp turns in the river were removed.

Port Sandfield Swing Bridge.—Two new bents were placed in the approaches, and the wheel track on the approaches double-decked with 2 in. plank 8 ft. long.

Huntsville Locks.—$245.12 was expended on breakwater and repairs to old dam.

Huntsville Swing Bridge.—New piers and a glance boom were placed at the north end of the bridge upstream. The bridge floor was double-decked with 2 in. plank 8 ft. long. $792 was spent on this work.

Magnetawan Swing Bridge.—This bridge received a general overhauling, all decayed members were replaced and the bridge put in a good safe condition. $558 was expended on the work.

Ryerson Swing Bridge.—This bridge was given general repairs. A new double deck wheel track 2 in. plank 8 ft. long was put on and the bridge was also repainted. $180 was spent on the work.

Ahmic Lake Dam.—General repairs were made on this dam at an expense of $36.41.

Gull Lake Dam.—A small dam was reconstructed at the outlet of Gull Lake, Gravenhurst. The old dam which controlled the level of the lake had been removed allowing the level of the Lake to fall. Navigation on the Lake was seriously interfered with. This lake is the source of supply for the Gravenhurst Water Works. The low state of water exposed many small swamps, and the decaying vegetation was a serious menace to the quality of the water. At the request of the residents around the Lake the Department renewed the dam. It is rebuilt with small concrete abutments 18 in. high. Stop-logs 8 ft. long are placed in the

dam to raise and hold the water 15 in. above the low water level. When the water rises to this elevation it will escape freely over the top of the dam. The stop-logs are to be removed to allow the free escape of the spring floods. The work cost $56.00.

Beacons at the Peninsula Canal were repainted and the usual work of removing sunken logs, snags, etc., was performed at the Peninsula Narrows and on the Mary's River.

Rainy River District Bridges.

Mine Centre Bridge was repaired at a cost of $54.00.

McKelvie Bridge.—The grade at this bridge, which is constructed of clay, has been built up from time to time and went down twice during the season. The grade was restored, gravel being largely used in the new fill.

Biddeson Creek Bridge.—The municipality of McIrvine rebuilt the bridge over this creek on the Rainy River Road under plans supplied by this Department. The Department furnished the steel at a cost of $340, and also furnished the cement at a cost of $160.

Soo District Bridges.

Magpie Bridge.—The floor of this bridge was repaired at a cost of $19.83.

Goulais Bridge, Fenwick.—$119 was expended in repairing the approaches to this bridge. New approaches will require to be built at an early date.

Algoma District Bridges.

Alton Bridge, Lot 6, Concession 2, Aberdeen.—The steel from the old Garden River Bridge was erected on timber pile abutments. The span is 100 ft. The steel was erected by P. R. Switzer, foreman. The floor joist consists of 8 lines of 3 x 12 pine. The cover is 5 in. flatted cedar. The approaches are stone-filled and covered with gravel. A substantial guard rail is placed at each side of the approaches. The entire cost of the bridge was $938.

Marsh River Bridge, Patten.—Located over the Marsh River in the 3rd Concession of Patten. The bridge is 87 ft. long and consists of a central span of 34 ft. and two approach spans of 28 and 25 ft. The stringers, 5 in number, are of flatted pine and the cover is of flatted cedar. A substantial railing is placed at each side. $235 was expended on the work.

McKays Bridge, Aberdeen.—Located over the Thessalon River, on Lot 7 on the 3rd Concession. The bridge consists of a 30 ft. truss span on pile piers. The approaches were filled with gravel. The work cost $295.

Black Creek Bridge, Plummer.—A new bridge was constructed over Black Creek on Lot 2 in Concession 7, at a cost of $263.

Fagan's Bridge, over the Little Thessalon River in Thessalon Township, was repaired by placing on it stringers taken from the old Ansonia bridge.

Massey Bridge.—The plank floor on the steel bridge over the Spanish River at Massey had become badly worn and it was becoming dangerous to public travel. A new wheel track of 2 inch pine plank 8 ft. long, was laid over the old floor its entire length. Before the new floor was laid the old floor was given a good coat of pitch. The entire cost of work and material was $364.55.

Webbwood Bridge.—The timber trestle at the west end of this bridge, built in 1906, had become dangerous through decayed timber. It was renewed this season in timber at a cost of $1,040.00.

Sudbury District Bridges.

McKenzie Creek bridge, Balfour.—Located over a creek on Lot 9, Concession 2, Balfour. The old bridge was entirely used up and a new bridge with a 16 ft. span was constructed at a cost of $290.00.

Sturgeon Falls District Bridges.

The following bridges were repaired in the Sturgeon Falls district:—

Lalonde and Lafontaine Bridges, cost	$302.14
Filiatrault Bridge	144.15
Biscean Bridge, new floor	24.50
Tomacean Bridge, new floor	26.25
Cache Creek Bridge	38.90
Martin and Begin Bridges	98.70

Temiskaming District Bridges.

Sunday Creek Bridge, Dack.—Located over Sunday Creek on Lot 8, 2nd Concession Road of Dack. The old bridge was burned. The new bridge, built on pile piers, is 60 ft. long. It has a central truss span of 28 ft. with a 16 ft. approach span at each end. The bridge, with the necessary grading, cost $378.00.

Taylor Creek Bridge, Evanturel, Ingram Townline.—This work consists of diverting the creek at an S. crossing of the road. Two bridges had been washed out by a flood. A cut, 20 rods long on the east side of the road, diverted the creek and allowed the filling in of the two bridges. The work cost $200.00.

Marter Townline Bridge, White River.—The timber bridge over the White River at Lot 6 on the South Boundary of Marter, was destroyed and carried away by a log jam early in the season. It was decided to rebuild the bridge with a long steel span on timber piers with timber trestle approaches. A steel span 150 ft. centre to centre was purchased from the Hamilton Bridge Works Company, for $3,775.60 f.o.b. Englehart. C. R. Dolmage was furnished with plans and placed in charge of the construction. Bridge seats were built on three rows of piles. At the east end three spans of pile trestle 16 ft. centre to centre were placed, and at the west end three spans of pile trestle were placed, giving an overall length of 240 ft. The stringers in the steel span consist of five lines of 10 in. steel beams. The handrail consists of three lines of galvanized pipe. The cost of the bridge complete was $5,750.00.

Nipissing District Bridges.

Tenth Concession Bridge, Papineau.—Located over a creek at Lot 15 on the 10th Concession of Papineau. The work consists of building a timber bridge 10 ft. long, and building up 180 feet of road grade. The work cost $150.00.

Fifteenth Sideroad Bridge, Papineau.—Located on the 15th Sideroad over a creek, in the 11th Concession. A new bridge 10 ft. long was built and 550 ft. of road graded. The work cost $150.00.

Wassa Creek Bridge, Concession 18, Chisholm.—The Township of Chisholm constructed a timber bridge over the Wassa Creek, on the 10th Sideroad, in Concession 18. The bridge is 22 ft. long and 7 ft. high. The approaches were built up over a distance of 54 rods in the creek flats. The work cost $329.00. Of this amount the Department contributed $200 in wages.

Parry Sound District Bridges.

Eagle Lake Bridge.—Located over the Narrows of Eagle Lake, near the line between Concessions 5 and 6, in the Township of Machar. The work consists of a rock fill entending from the west shore 65 ft. The fill has a top width of 18 ft. and runs from four to eleven feet high. The top or roadway is covered with gravel. A large amount of filling yet remains to be done; $513.00 was expended on the work.

Pickerel River Bridges.—The raising of the level of Dollars Lake to provide for navigation necessitated the raising of the Highway Bridge over the Pickerel on Lot 3, Concession 2, Township of Blair, near Wilson's Rapids. The centre of the bridge was raised 10 ft., new frame bents were built up from the old caps. Apart from the new frame bents the old timber was used in the construction.

Dollars Bridge.—A highway bridge over the same stream, located on Lot 30, in 9th Concession of McConkey, had also to be raised to permit the passage of log drives. This bridge was raised five feet and approaches properly graded.

Muskoka District Bridges.

Black Bridge, South Branch.—Located over the South Branch of Muskoka River, in 8th Concession of Draper. The work consisted in replacing rotten timbers in the centre pier under the steel, and replanking the entire length of the bridge, 160 ft. The municipality of Draper supplied the material. The work cost $90.00.

Bala Bridge.—The concrete in the foundation of the north pier did not take a proper set at the time of construction. Being confined in a crib it could not entirely escape. The action of the water carried away a quantity of the foundation. Last fall all the mortar in the foundation that could be reached was removed and the holes filled with a grout of rich cement mortar. The foundation is now secure. The work cost $44.00.

Addington Bridges.

Horseshoe Lake Bridge, Kennebec.—A grant of $150.00 was made to this bridge, the county furnishing the balance of the funds required. The bridge is 37 ft. long with concrete abutments, 12 ft. high, built on stone-filled foundations. The approaches are 28 ft. and 33 ft. long, averaging 10 ft. in height, and are stone filled. The cost of bridge was $450.00.

Mud Lake Bridge, Olden.—Located on the road between Long Lake and Mountain Grove. The bridge is 18 ft. long with stone abutments and stone-filled approaches. The Department contributed $150.00 toward the cost of the bridge. The settlers and municipality made up the balance of the cost—about $200.00.

South Renfrew Bridges.

Basin Depot Bridge.—Located over Depot Creek on Lot 26, Concession 3, Richards. It is 40 ft. long on timber cribs. It is covered with 4 inch plank on four lines of cedar stringers. The west approach, 250 ft. long, is built up to an average height of 5 ft. The full cost of the work was $594.00.

Radcliffe Bridge.—Located over a creek near Combermere on Lot 7, in the 6th Concession of Radcliffe. The bridge was a long timber structure. This has been shortened to 20 ft. and the gully has been filled. The work complete cost $400.00.

Opeongo Line Bridges, Brudenell.—This work consists of the renewal of three timber bridges situate on Lots 312 and 313, in the Township of Brudenell. No. 1 consists of a stone fill 120 ft. long and 5 ft. high. A waterway is provided in a cedar culvert 4 ft. x 5 ft. No. 2 is a cedar bridge 20 ft. long. No. 3 is a cedar bridge 16 ft. long. The whole work on the three bridges cost $396.00.

DRAINAGE WORKS CONSTRUCTED BY THE DEPARTMENT.

Rainy River District.

Atwood Curran Drain.—Commenced at the south-east corner of the Township of Curran and runs west on the Townline between Curran and Atwood to the Miller Creek, thence south along the creek to a proper outlet.

Nelles Drain, Section 2.—Commences near the middle of Section 2 on the west boundary, and runs south-east to the south boundary. Thence south along a creek about 1,000 ft. This drain is to provide an outlet for the road ditch on the west boundary of Nelles.

Shenston-Dobie Drain.—The work consists of opening up a drain across Section 25, Shenston, to the townline, thence east along a creek in the 5th Concession of Dobie to a proper outlet.

Carpenter, 3rd Concession Drain.—Opening up of Soper Creek from the 3rd Concession at Lot 2, east to the townline, thence east and south along creek to a proper outlet.

Mather, 3rd Concession Drain.—Construction of 50 rods of drain on 3rd Concession road, and opening up of 100 rods of a creek to Lot 8 in the 3rd Concession; $5,705.82 was expended on the above works during the past season.

Algoma Drainage.

Keating Location Drain.—Located on Lots 4 and 5, Concession 6, Plummer additional. The work consists of opening up 76 rods of drain on the road, making a rock cut 150 ft. long, also opening up 264 rods of creek to provide a proper outlet for the road drain; $276.00 was expended on the work.

Carter Creek, Johnson.—This work was started in 1913, but lack of funds prevented the proper completion of the work. The work was continued this season, $245 being expended to properly complete the work as originally intended.

Thompson's Creek, Plummer.—This work consisted of clearing out about half a mile each of two creeks on Lot 2, in the 3rd and 4th Concessions of Plummer. The creeks are cleared of logs, brush, etc., for a width of two rods. An outlet 3 ft. deep and 8 rods long was opened up through a beaver dam; $102.00 was expended on the work.

Manitoulin Drainage.

Sandfield Drain.—Located on Lot 10, Concession 10. The work consisted of draining a wet hollow in the road at Lot 10, raising the road grade over a length of 15 rods, and opening up an outlet 80 rods long. The work cost $101.00.

Campbell Drain, 11th Concession.—This work consisted of opening a drain through a creek over a distance of 90 rods on Lot 22, in the 11th Concession. Wet weather prevented the full completion of the drain; $55.00 was expended on the work.

Campbell Drain, Concession 16.—This work consisted in opening up a rock cut on the road opposite Lot 1, in the 16th Concession. The cut is 15 rods long; $131.00 was expended on the work.

Mills Drain, Concession 6.—This work consists of opening up a drain 230 rods long across Lots 10, 11, 12, in the 6th Concession of Mills, also clearing out 110 rods of creek bottom; $150 was expended on this work.

Louise Drain, Concession 6.—This drain runs from Lot 2 to Lot 8, in the 6th Concession of Louise. The drain is 600 rods long, and cost $285.00.

Sudbury Drainage.

Hanmer, 3rd Concession Drain.—This work commences on Lot 9, in the 3rd Concession of Hanmer, and runs south-west to the Hanmer drain, a distance of about three miles. The work consists of clearing up the creek bottom over a width of 30 ft. to provide a free passage for the creek water; $500 was expended on the work.

Capreol Drain, Concession 1.—Runs across Lots 5 and 6, in the 1st Concession of Capreol, and empties into Whitson Creek. The drain is 10 ft. wide and from 2 to 4 ft. deep; $400 was expended on the work.

Blezard Drain, Concession 5.—This drain commences at Lot 6 and runs through a swale across Lots 7, 8, and 9, in the 5th Concession of Blezard, emptying into Whitson Creek. The drain runs about 3 ft. deep and from 5 to 8 ft. wide. It is brushed out for 15 ft. on each side. The work cost $300. It will require $100 to complete the drain as originally intended.

Lumsden Boundary Drain.—Located in front of Lot 8, in the 1st Concession of Lumsden. The drain is in a heavy timbered swamp. The 160 rods constructed cost $200.00.

Balfour, 4th Concession Drain.—Runs across Lots 6, 7, and 8, in Concession 4, Balfour, a distance of 500 rods. The work cost $100. This drain will require to be extended about one mile west to reach a proper outlet in the Vermilion River.

Sturgeon Falls Drainage.

Springer Drain.—This drain was constructed about two years ago. This year the drain was extended south about 240 rods, at a cost of $200. The drain constructed is from 8 to 10 ft. wide and from 1½ to 2½ ft. deep.

McPherson, 5th Concession Drain.—This drain is two and one-half miles long, located in the 5th Concession. The drain is from 10 to 12 ft. wide and is 2½ ft. deep. Two rock cuts, 20 or 30 ft. long, were blasted through solid rock obstructions. The work complete cost $800.00.

Temiskaming Drainage.

Evanturel, 4th Concession Drain.—This drain is located on Lot 8, in the 4th Concession; 126 rods of new ditch was opened up to a good outlet; 91 rods of an old ditch was deepened, and 130 rods for the continuation of the ditch has been cleared and stumped; $342 was expended on the work.

Harley, 3rd Concession Drain.—This drain commences on the line of Lots 2 and 3, in the 3rd Concession of Harley, and runs south 100 rods to the road, thence east on the road 47 rods to a creek and south on the creek on Lot 3, 76 rods. All obstructions were removed from the creek bed over a distance of 125 rods. Five beaver dams were opened up; $532.00 was expended on the work.

Hilliard, 6th Concession Drain.—This drain is situate on Lot 7, in the 6th Concession of Hilliard. It runs south-east into Little Otter Creek; 207 rods of ditch was opened up, and the right-of-way for the extension of the drain cleared for a distance of 287 rods; $320.00 was expended on the work.

Marter Bayley Drain.—This drain commences on Lot 1, in the 1st Concession of Marter, and runs east a distance of 176 rods to a creek in Lot 1, Concession 1, Bayley. The right-of-way for the extension of the drain west has been cleared for a distance of 80 rods; $218.00 was expended on the work.

Sutton Creek Drain, Harris and Casey.—This work embraces the clearing out of Sutton Creek, in the 5th and 6th Concessions of Harris. All logs, brush and other obstructions were removed from the creek-bed over a distance of 404 rods. A space of 15 ft. in width was cleared on each side of the creek over a distance of 272 rods, and a space 15 ft. in width on one side was cleared over a distance of 132 rods. The work will require to be extended about half a mile farther north to reach the Casey Townline; $500.00 was expended on the work.

Nipissing District Drainage.

In the District of Nipissing the following drains were opened up:—
On Lot 3, Concession 9, and Lot 2, Concession 10, Bonfield—131 rods.
On Lot 2, Concession 12, and Lot 2, Concession 13, Bonfield—73 rods.
On Lot 12, Concession 7, Ferris—49 rods.
On Lot 1, Concession 6, to Lot 4, Concession 8, Ferris—234 rods.
On Lot 19, Concession 1, to Lot 19, Concession 2, Ferris, 125 rods.
On Lot 11, Concession 10, to Lot 11, Concession 11, Ferris—103 rods.
On Lot 10, Concession 11, to Lot 13, Concession 11, Ferris—210 rods.
On Lot 6, Concession 8, to Lot 10, Concession 8, Ferris—200 rods.
On Lot 19, Concession 6, Ferris—100 rods.
On Lot 21, Concession 4, Ferris—66 rods.
On Lot 6, Concession 9, to Lot 10, Concession 8, Chisholm—200 rods.
On Lot 18, Concession 9, Chisholm—66 rods.

$120.00 was expended in removing rock from the outlet of Wassa Lake. The total expenditure on this class of work was $1,272.00.

Parry Sound Drainage.

Restoule Chute Improvement.—This work consists of rock excavation in the Narrows between Commanda Lake and Restoule Lake to allow of a freer escape of flood water from Commanda Lake. A channel about 30 ft. wide and from two to four feet deep was opened up through the ledge of rock that formed the obstruction. The work cost $349.00.

Muskoka Drainage.

Beatty Lake Drainage.—Work located on Lot 11, Concession 6, Township of Ryde. It consists of a rock-cut 3 ft. below lake level. The old channel is very crooked, and to obtain the same fall as is obtained in the new outlet would involve a very large expenditure. The rock cut is 3 ft. wide at the bottom with side slope of 3 in. per ft. The work complete cost $182.00.

Ryde, 5th Concession Drain, Lewisham.—Located on the 5th Concession, Ryde. it commences on Lot 6, about 100 ft. west of the 5 and 6 Sideroad and extends east into Lot 5, a distance of 1,100 ft. The work provides an outlet for a section of road that has heretofore been subject to periodic flooding. A cedar culvert was put in at the road crossing. The work complete cost $220.00.

East Simcoe Drainage.

In this district outlets were opened up at the following locations:—
On Lot 15, Concession 7, North Orillia.
On Lot 12, Concession 7, North Orillia.
On Lot 3, Concession 12, Oro.
On Lot 9, Concession 10, Medonte.
On Lots 5 and 6, Concessions 13 and 14, Medonte.
On Lot 8, Concession 13, Medonte.
$500.00 was expended on this work.

ONTARIO COUNTY.

Mara-Rama Drainage.

Corrigan Drain.—Last year this drain was opened up from the 11th Concession road south-west across Lots 18, 17, and 16, in the 10th Concession of Mara. This season the work was continued north from the 11th Concession road, a distance of about one mile to the 12th Concession Road; $151.00 was expended on the work.

Mahoney Drain.—In 1913 the portion of this drain on Lots 25, 26 and 27, in the 11th Concession of Mara, was opened up. This season the work was extended north through the 12th and 13th Concessions, a distance of 503 rods; $364.00 was expended on the work.

Mara-Rama Drain.—This drain is located on Lots 25, 26, 27 and 28, in the 13th Concession of Mara. It empties into Lake Couchiching. The drain is two miles long. It runs from one and one-half to three and one-half feet deep, with a bottom width of from two to five feet; $591.00 was expended on the work.

Udney Drain.—This drain extends from the centre road in the 8th Concession of Mara south-west, a distance of two miles, to the Grand Trunk Railway. The drain runs from two to four and one-half feet deep. Rock was encountered in a few places, which greatly increased the cost; $223.00 was expended on the work.

Lockmasters' Returns.

The following are the Lockmasters' returns for the year 1914:—

Port Carling Lock.—5078 steamers, 544 small boats, 651 scows, 94 rafts or cribs of timber.

Magnetawan Lock.—684 steamers, 296 small boats, 396 scows, 83 rafts.

Mary's and Fairy Lakes Lock.—529 steamers, 556 small boats, 66 scows, 826 rafts.

Orillia Hospital Railway Coal Trestle.

To facilitate the unloading of the large tonnage of coal required each year at the Orillia Hospital for Feeble-Minded, a new Grand Trunk Railway siding 700 ft. long, including trestle, was installed at a cost of $733.89, to serve a timber coal trestle. The new siding is 500 feet south of the old switch, and is

located between the Grand Trunk Railway and Lake Simcoe. The trestle is 153 feet long, which is sufficient to provide accommodation for four coal cars. From the ground up to the underside of the stringers a clear distance of 15 ft. 6 in. is available for storing the coal, and with very little labour the entire quantity required during the year can be easily received and unloaded.

All work of grading the siding and constructing the trestle was carried out by the institution labour, under the direction of a Public Works Department foreman, and the laying of the ties and rails was done by the same gang under the supervision of a Grand Trunk Railway Inspector.

The trestle at the north end is supported by a stout concrete abutment 16 ft. high from the ground to the top of the ballast wall, and provided with straight wingwalls battered down at the rate of 1½ ft. horizontal to 1 vertical to retain the fill. Concrete pedestals 12 ft. 9 in. centre to centre are provided to carry framed bents, and at the south limit a concrete pier supports the Ellis Bunter Block at the end of the track. The framed bents which carry the stringers and track are composed of four posts each one foot square and eleven feet long, with the two centre posts plumb and outside posts battered. Each bent is well cross-braced with 3 in. x 10 in. planks, and every second pair of bents is framed as a tower.

Caps and sills are of 12 in. x 12 in. material, and stringers are 8 in. x 16 in., there being six lines of track stringers, three under each rail and two lines of jack stringers, one at each end of the tie. Ties are of 10 in. x 10 in. stuff and guard rails of the same size run the full length of the trestle. The total cost of the entire work was $2,265.81.

Extension of Railways.

Railway construction during the past year did not keep pace with the rapid extension of former years. 233.94 miles of new line was opened for traffic.

Algoma Central Railway.—This Company completed the line between the Soo and the Transcontinental by opening the last section of the line between Oba and Hearst, a distance of 50.1 miles.

Canadian Northern Railway.—The Company increased its mileage in Ontario by completing 118.94 miles of track between Capreol and Ottawa.

Canadian Pacific Railway.—During the year this Company took over the projected Lake Erie and Northern Railway between Galt and Port Dover. Twenty-two miles of track were laid between Galt and Brantford, and a large amount of construction work on bridges and grading was done between Brantford and Port Dover.

This Company also took over the Glengarry and Stormont Railway, and opened up twenty-seven miles of the new line between Cornwall and St. Polycarpe Junction.

Toronto, Hamilton & Buffalo Railway.—This Company increased its mileage 14.9 miles by opening up a new line between Smithsville and Dunnville, in the Niagara peninsula.

STATEMENT OF ELECTRIC RAILWAY MILEAGE IN ONTARIO

Number.	Name of Company.	Length of line.		Number of power houses.		Remarks.
		Completed.	Under construction.	Steam power.	Water power.	
1	Berlin and Waterloo.....3.02	.....	.....	1	.....	Hydro-Electric Power
	Leased Line, Berlin and Bridgeport.....2.50	5.52				
2	Brantford Street.....	8.95	.....	1	.....	Power supplied by the Cataract Power Co.
3	Brantford and Hamilton Electric Ry.	23.00	.....	.....	.....	" "
4	Chatham, Wallaceburg and Lake Erie	40.00	.....	.....	.....	Power, Chatham Gas Co.
5	Cornwall Street.....	6.50	.....	1	1	
6	Grand Valley.....	20.76	.....	1	.....	Power purchased from Cataract Power Co.,
7	Guelph Radial.....	6.	.....	1	.....	Decew Falls.
8	Galt, Preston and Hespeler.....15.67					
	Leased Line, Preston to Berlin 10.75	26.42	.....	1	.....	Hydro-Electric Power.
9	Hamilton Street.....	32.00	.....	.....	.....	Power, Cataract Power Co.
10	Hamilton and Dundas	7.00	.....	.....	.....	Power, Cataract Power Co.
11	Hamilton Radial	22.00	.....	1	.....	" "
12	Hamilton, Grimsby and Beamsville..	23.00	.....	1	.....	" "
13	International Transit Co.....	3.3	.....	.....	.....	Sault Ste. Marie rent h. p. from Lake Superior.
14	Kingston, Portsmouth and Cataraqui.	8.	.....	1	.....	
15	London and Lake Erie Railway and Transporation Co.....	29.	.....	.....	.....	Hydro-Electric Power,
16	London Street	34.97	.....	1	.....	Hydro and Steam.
17	Mount McKay and Kakabeka Falls..	4.0	.....	.....	.....	
18	Niagara Falls Park and River.....	11.85	.. ...	.....	1	Subject to the control of Niagara Falls Park Commissioners.
19	Niagara, St. Catharines and Toronto.	48.56	.....	.....	.....	
20	Niagara Falls, Wesley Park & Clifton	4.56	.....	.....	.....	
21	Nipissing Central	15.37	.....	.....	.....	The Northern Ontario Power Co.
22	Ottawa City Passenger	24.67	.....	.....	1	
23	Oshawa Railway.....	8.3	.....	.....	.....	
24	Port Arthur and Fort William	23.0	0.75	.....	1	Power, Kaministikwia Power Co.
25	Peterboro Radial	6.10	.....	.....	2	Peterborough Hydraulic Power Co.
26	Port Dalhousie, St. Catharines and Thorold	8.17	.....	.....	.....	
27	Sarnia Street.....	9.25	.....	.....	.....	Sarnia Gas and Electric Light Co.
28	Sandwich, Windsor and Amherstburg	29.27	.....	1	.....	Canadian Salt Co.
29	St. Thomas Street	7.5	.....	.....	.....	Hydro-Electric Power.
30	Toronto and York Radial, Toronto, Metropolitan Branch	59.44	.....	2	.....	Toronto Power Co.
	Toronto and Mimico.....	11.11	.....	.....	.....	" " "
	Toronto and Scarborough	11.45	.....	.....	.....	" " "
31	Toronto Civic Car Lines.....	8.42	1.49	.....	.....	Hydro-Electric Power
32	Toronto Suburban	17.25	92.00	.....	.....	Toronto Power Co.
33	Toronto Street.....	132.62	.....	.....	.....	The Toronto Power Co. Mileage includes turn-outs and terminals.

STATEMENT OF ELECTRIC RAILWAY MILEAGE IN ONTARIO—Continued.

Number.	Name of Company	Length of line.		Number of power houses		Remarks.
		Completed	Under construction	Steam power.	Water power.	
34	Windsor and Tecumseh Electric Ry.	10.	.....	.....	.....	Operated by the Sandwich, Windsor and Amherstburg Ry.
35	West Shore Electric	.....	30.	.....	.....	Huron and Bruce Counties.
36	Woodstock, Thames Val. and Ingersoll	11.5	.....	1	.....	Power, Cataract Power Co., Decew Falls.
37	Windsor, Essex and Lake Shore Ry..	40.0	.....	1	.....	
	Total mileage	798.81	124.24	.....	.....	

Total year's increase 37.65.

REVISED STATEMENT OF RAILWAY MILEAGE IN ONTARIO TO DECEMBER 31ST, 1914.

No.	Name of Railway.	Terminal Points.		Completed prior to Confederation.	Completed since Confederation.	At present under construction.	Total length completed of each railway or system of railways in miles.
		From	To	Length in miles.	Length in miles.	Length in miles.	
1	**Grand Trunk Railway,** Main Line	East Prov. Bound	Point Edward	457			
2	do Buffalo and Lake Huron Branch	Fort Erie	Goderich	158			
3	do London Branch	St. Mary's	London	23			
4	do Galt and Doon Branch	Galt	Berlin	7	4.5		
5	do Waterloo Junction Railway.	Waterloo	Elmira		10.25		
6	do Toronto and Nipissing Branch	Toronto	Coboconk		88		
7	do Midland Railway, Main Line	Port Hope	Midland	65	54.53		
8	do do Peterboro' Branch	Millbrook	Lakefield	13	9		
9	do Lake Simcoe Junction	Stouffville	Jackson's Point		26.5		
10	do Whitby, Port Perry and Lindsay	Whitby	Lindsay		46		
11	do Victoria Railway	Lindsay	Haliburton		55.81		
12	do Grand Junction Railway	Belleville	Peterborough		64.65		
13	do Belleville and North Hastings	Madoc Junction	Eldorado		22		
14	do Toronto and Ottawa	Madoc	Bridgewater		9		
15	do do Manilla Link.	Wick	Manilla		6.5		
16	do do Omemee Link.	Omemee	Peterborough		14		
17	do Port Dover and Lake Huron	Port Dover	Tavistock		55.68		
18	do South Norfolk Railway	Simcoe	Port Rowan		17		
19	do Chemong Branch	Peterborough	Chemong Lake		9		
20	do Stratford and Huron	Stratford	Wiarton		106.27		
21	do Owen Sound Extension	Parkhead Junction	Owen Sound		12.40		
22	do Georgian Bay and Wellington	Palmerston	Durham		26		
23	do Northern Railway, Collingwod Line	Toronto	Meaford	94	21		
24	do Muskoka Branch	Barrie	Gravenhurst		53		
25	do Hamilton and Northern, Main Line.	Port Dover	Allandale		135.3		
26	do do do Collingwood	Clarksville	Collingwood		40		
27	do North Simcoe Junction	Colwell	Penetanguishene		33.34		
28	do Midland Branch	Wyevale	Tiffin		9		
29	do Birch-Tay Branch	Birch	Tay		8.9		
30	do Northern and Pacific Junction Rlwy	Gravenhurst	Nipissing Junction		111.5		
31	do Magnetawan River Railway	Burk's Falls Station	Burk's Falls Wharf		1.01		
32	do Toronto Belt Line Rly., East Section	Don Station, G.T.R.	Junc. Northern Ry.		8.50		
33	do do Western Section	W. Toronto, on G.T.R	Swansea		4.33		

REVISED STATEMENT.—Continued.

No.	Name of Railway.	Terminal Points.		Completed prior to Confederation.	Completed since Confederation.	At present under construction.	Total length completed of each railway or system of railways in miles.
		From	To	Length in miles.	Length in miles.	Length in miles.	
	Grand Trunk Railway—continued						
34	do Canada Atlantic Railway	East Prov. Bound	Ottawa		68.08		
35	do Ottawa, Arnprior & Parry So'nd Ry.	Ottawa	Scotia Junction		212.60		
36	do Parry Sound Colonization Ry	Scotia Junction	Depot Harbor		51.20		
37	do Central Counties Railway	Glen Robertson	Hawkesbury		21		
38	do do do	South Indian	Rockland		17		
39	do Railway { Great Western Div. / Main Line }	Niagara Falls	Windsor	229			
40	do Toronto and Hamilton Branch	Toronto	Hamilton	39.5			
41	do Loop Line Division	Glencoe	Fort Erie		145		
42	do Kingscourt and Glencoe Link	Kingscourt Junction	Glencoe		20.6		
43	do Sarnia Branch	Komoka	Sarnia	51			
44	do Petrolea Branch	Wyoming	Petrolea	7			
45	do Brantford Branch	Harrisburg	Brantford	8			
46	do Brantford and Tillsonburg	Brantford	Tillsonburg		35.88		
47	do Lynden to Brantford	Lynden	Brantford		4.12		
48	do Wellington, Grey and Bruce	Harrisburg	Southampton	27	102		
49	do do S. Extension	Palmerston	Kincardine		66		
50	do G. W. Div., London, Huron & Bruce.	Hyde Park Junction.	Wingham		69.75		
51	do do Welland Railway	Port Colborne	Port Dalhousie	25			3,079.7
52	**Canadian Pacific Railway** Main Line	East Prov. Bound	West Prov. Bound	57	1,216.40		
53	do Algoma Branch	Sudbury	Sault Ste. Marie		180.25		
54	do Brockville and Ottawa Railway	Brockville	Carleton Place	46			
55	do St. Lawrence and Ottawa Railway and Chaudiere Branch	Prescott	Ottawa	59.5			
56	do Ontario and Quebec Railway	West Toronto	East Prov. Bound	12	281.25		
57	do do Don Branch	Leaside Junction	Toronto		5		
58	do Credit Valley Railway, Main Line	Toronto	St. Thomas		119.13		
59	do do Mimico Branch	Islington	Mimico		2.60		
60	do do Orangeville Branch	Streetsville Junction	Elora & Orangeville		61		
61	do do Guelph Branch	Campbellville	Guelph		15		
62	do Toronto Grey & Bruce, Main Line	Toronto	Owen Sound		122		
63	do do Teeswater Branch	Orangeville	Teeswater		72		
64	do Toronto Grey & Bruce, Wingham Branch	Glen Annan	Wingham		4.75		
65	do West Ontario Pacific Railway	Woodstock	London		26		

REVISED STATEMENT—Continued.

No.	Name of Railway.	Terminal Points.		Completed prior to Confederation.	Completed since Confederation.	At present under construction.	Total length completed of each railway or system of railways in miles.
		From	To	Length in miles.	Length in miles.	Length in miles.	
66	C.P.R. West Ontario Pacific Rly.. Detroit Extenson	London	Windsor		112.50		
67	do Atlantic and North-West Railway	Renfrew	Eganville		19.25		
68	do Lindsay, Bobcaygeon and Pontypool Ry	Burketon	Bobcaygeon		38.79		
69	do Sudbury and Toronto Branch	Bolton	Romford Junction		226.20		
70	do South Ontario Pacific Railway	Guelph Junction	Hamilton		16.3		
71	do Guelph and Goderich Railway	Guelph	Goderich		88		
72	do do Listowel Branch	Listowel Junction	Listowel		16.10		
73	do Walkerton. Lucknow Railway	Saugeen Junction	Walkerton		37.70		
74	do Tillsonburg, Lake Erie & Pacific	Port Burwell	Embro		46.11		
75	do St. Mary's & Western Ontario Ry	Embro	St Mary's		15.90		
76	do Georgian Bay & Seaboard Railway	Port McNicoll	Bethany		90.86		
77	do Campbellford, Lake Ontario and Western Railway	Glen Tay Junction	Agincourt		182.60		
78	do Glengarry and Stormont Railway	Cornwall	St. Polycarpe Jct.		27.00		
79	do Lake Erie and Northern Railway	Galt	Port Dover		22.00	29.10	
80	Kingston & Pembroke Railway	Kingston	Renfrew		103		3,322.19
81	**Michigan Central Railway**, formerly Canada Southern, Main Line	Windsor	Niagara Falls		226.80		
82	Michigan Central Railway, St. Clair Branch	St. Clair Junction	Courtright		62.2		
83	do do Amhertsburg Branch	Amherstburg	Essex Centre		15.7		
84	do Oil Springs Branch	Oil City Junction	Eddy's		5.2		
85	do Petrolea Branch	Petrolea Junction	Petrolea		4.9		
86	do Leamington & St. Clair Branch	Comber	Leamington		15.9		
87	do Fort Erie Branch	Welland Junction	Fort Erie		17.4		
88	do Niagara Branch	Fort Erie	Niagara	30			378.10
89	Cobourg, Peterboro' & M'mora Ry., M'mora Line	Cobourg	Harwood	14.5			14.50
90	Lake Erie and Detroit River Railway	Walkerville	St. Thomas		126.85		
91	do Erie and Huron Railway	Rondeau	Sarnia		70.47		
92	do London & Port Stanley Railway	London	Port Stanley	25			222.32
93	**Canadian Northern Railway.** Port Arthur, Duluth and Western Railway, and Ontario & Rainy River Railway, Main Line	Port Arthur	West Prov. Bound		287		
94	do do Duluth Extension	Stanley Junction	Gun Flint Lake		66.54		
95	do do James Bay Railway	Canada Atlantic Ry.	Parry Harbor		3.7		

REVISED STATEMENT—Concluded.

No.	Name of Railway.	Terminal Points.		Completed prior to Confederation.	Completed since Confederation.	At present under construction.	Total length completed of each railway or system of railways in miles.
		From	To	Length in miles.	Length in miles.	Length in miles.	
96	Canadian Northern Ontario, Toronto & Sudbury Line	Toronto	Sudbury		265		
97	do do Key Branch	Key Junction	Key Harbor		6.2		
98	do do Hutton Branch	Sudbury Junction	Sellwood Junction		27.8		
99	do do Garson Branch	Garson Junction	Garson Mine		3.7		
100	do do Orillia Branch	Orillia Junction	Atherly Junction		7.4		
101	do do Ottawa, Hawkesbury	Ottawa	Hawkesbury		58		
102	do do Ottawa-Capreol	Ottawa	Capreol		304.69		
103	do do Port Arthur, Sudbury	Ruel	Port Arthur		545.00		
104	do do Toronto-Ottawa	Toronto	Ottawa		219.61		
105	do do Central Ontario Railw'y	Trenton, on G.T.R.	Maynooth		110.00	20.00	
106	do do Bay of Quinte Railway	Deseronto	Bannockburn		78.45		
107	do do do do	Yarker	Sydenham		11.37		
108	do do do do	Deseronto	Grand Trunk Ry		3.50		
109	do Irondale, Bancroft and Ottawa Rly	Kinmount	Bancroft		45.00		
110	do Brockville, Westport and Sault Ste. Marie	Brockville	Westport		45.00		
111	do Prince Edward County Railway	Picton	Trenton and G.T.R.		32.44		
112	do Ontario & Belmont & Northern Rly.	Central Ontario Rly.	Belmont Mine		9.57		2,129.97
113	Toronto, Hamilton and Buffalo Railway	Waterford	Brantford		18		
114	do do do	Brantford	Welland		62.5		
115	do do do	Smithville	Dunnville		14.9		95.4
116	Ottawa and New York Railway	Ottawa	Cornwall		55.00		55
117	Pembroke Southern Railway	Pembroke	Golden Lake		21.50		21.50
118	Algoma Central and Hudson Bay Railway	Sault Ste. Marie	Hearst		295.11		
119	do do Michipicoten Branch	Michipicoten Harbor	Main Line		22.10	0.62	317.21
120	Algoma Eastern Railway	Sudbury	Little Current		85.50		85.50
121	Bruce Mines and Algoma Railway	Bruce Mines	Rock Lake		17		17
122	Temiskaming and Northern Ontario Railway	North Bay	Cochrane		252		
123	do do do Branch Lines				71.29		323.29
124	Huntsville and Lake of Bays Railway	Peninsula Lake	Lake of Bays		1.5		1.5
125	National Transcontinental Railway	East Prov. Bound	West Prov. Bound		758		758
126	Grand Trunk Pacific Rly., Lake Superior Branch	Fort William	Lake Superior Junc.		188.77		188.77
127	Thessalon, Northern Ontario Railway	Thessalon Junction	Thessalon		1.93		1.93
128	Essex Terminal Railway	Walkerville	M. C. Tunnel Yard		10.10		10.10
	Year's increase, 233.94 miles.			1,447.5	9,574.48	49.72	11,021.98

DRAINAGE AID.

Cobb Lake Drainage, Clarence.

This drain begins near the line of Lots 8 and 9 in the 4th Concession of Clarence and runs south-east through Clarence, North Plantagenet, and South Plantagenet, emptying into the Nation River on Lot 19 in the 10th Concession of the latter township. The entire length is about eight and one-half miles. The upper end of the drain, about 9,000 ft. is through high ground. The bottom width is from 6½ to 8 ft. The balance of the work is through a swamp known as "Cobb's Lake." The bottom width runs from 15 to 30 ft. Dixons Creek joins the drain at the foot of Cobb's Lake. From here to Nation, a distance of two and one-half miles, the work is very heavy, the course of the drain being through high sandy ridges. These ridges have been the cause of all the trouble in the big swamp. When the Nation River is in flood the water backs into the swamp and submerges the entire area to a depth of from two to four feet. Owing to the small outlet from Dixon's Creek to the Nation the outflow from the swamp was very slow and the drainage was entirely inadequate for general farming.

The present scheme was undertaken to provide an efficient outlet. The lands will continue to be submerged during high water in the Nation, but as the water in the Nation subsides the new outlet will give early relief and render general farming practicable.

The estimated cost of the work was $47,750, and the drainage area comprised 27,213 acres, which under the engineer's assessment was distributed a follows:

Clarence Assessment	$37,077.07	—drainage	area,	15,129	acres.
North Plantagenet	4,171.13	"	"	11,353	"
South Plantagenet	4,906.07	"	"	731	"
Clarence Extension	1,595.73				

The work is practically completed the dredge being engaged in cleaning out sand washed in after work was done. The accounts are not all settled, but as near as can be estimated the entire work will cost $45,814.16. I examined the work in the fall of 1914 and on the recommendation of the Department the grant, $3,000, voted in aid of this scheme was paid over to the Township of Clarence.

Little Creek Drain, Tilbury.

The drain commences at the townline between Tilbury North and Tilbury West, and runs north through Lot No. 11, across the Township of Tilbury West to Lake St. Clair, a distance of 25,000 ft. or about four and three-quarter miles. The drain follows the course of a creek. It is a dredge cut with a bottom width of 18 ft. at the head, and a width of 24 ft. at the outlet. The depth varies from 6 to 12 ft.

The estimated cost of the drain exclusive of a new railway culvert, is $17,235.05. Of this amount $12,073.15 is assessed against lands and roads in Tilbury North, and $5,161.85 is assessed against lands and roads in Tilbury West.

I examined the drain in the fall of 1914, and on recommendation the grant of $2,000, voted in aid of this drainage scheme was paid to the Township of Tilbury North, the initiating municipality.

Long Marsh Drain, Anderdon.

This work was undertaken by the Township of Malden under By-law No. 473, dated April 28th, 1911. The work extends from the road known as the "Pike" north-westerly through Malden and Anderdon, to the line of Lots 11 and 12 in the 2nd Concession of Anderdon, where a sufficient outlet is reached. The length of the drain is 45,300 ft. or nearly nine miles. At the head, the drain has a bottom width of 18 ft. which is gradually widened to 30 ft. at the outlet. The depth ranges from 4 to 8 ft. The upper end of the drain is being constructed by teams and scrapers, while the lower large section is being excavated by a machine, a drag line scraper. The work was started in 1913, and is now nearing completion, a very large force being employed.

In 1913 a grant of $3,000.00 was voted to the Township of Anderdon and $1,500.00 was paid. At the last session of the Legislature the balance of the grant, $1,500.00 was revoted.

I examined the work in 1914, and on the recommendation of the Department of Public Works, the balance of the grant, $1,500.00 was paid to the Township of Anderdon.

McFarlane Drain, Dover.

This very extensive work was undertaken to provide an efficient outlet for a large area of low land in the 2nd, 3rd and 4th Concessions in the Townships of Chatham and Dover. The original outlet provided for these lands was the old McFarlane drain which ran south on the Baldoon Road to the River Thames. In former years the McFarlane drain gave a fair service, but of late years the high water in the river has prevented a proper discharge of the water from the drain, in fact, the river back-flows through the drain and submerges the low lands. When the river recedes the low lands are drained but the relief comes too late. In order to obtain proper, dependable drainage on the report of the engineer it was decided to abandon the old outlet and construct a new one west across the Township of Dover to Lake St. Clair. Together with constructing the drain it is necessary to install a number of automatic gates to shut off the back flow from the river. It is also necessary to make proper connections with the drainage system in the Township of Chatham. The proposed new outlet is 12½ miles long. The drain has a bottom width of 20 ft. at the head and is gradually widened to 40 ft. at the outlet. The drainage basin comprises an area of 20,200 acres. The estimated cost of the work was $80,010.40, which is assessed as follows:

On lands and roads in the Township of Chatham.....	$31,601.00
On lands and roads in the City of Chatham	62.75
On lands and roads in the Township of Dover	48,346.65

The work was examined by an engineer of this Department and the grant of $4,000 was paid over to the Township of Dover, the initiating municipality.

McLellan and Booth Creek Drain, Dawn.

This drain begins opposite Lot 26 and extends north on the 8th Concession Road, a distance of 1,770 ft. Thence it extends west through Lot 27, joining Booth Creek on Lot 28 in the 5th Concession. It then follows the water course

to the Sombra boundary, making a total length in Dawn of 41,780 ft. or nearly 8 miles. The work continues through Sombra, following the creek a distance of 11,420 ft. making the full length of the drain ten miles and 400 ft. The work ends on Lot 28 in the 13th Concession of Sombra. Below this point the benefit from the work would not warrant the cost of a drain sufficient to contain the flow of water, and land damages were paid to the amount of $1,500 to the owners of low-lying lands which are liable to flooding below the point where excavation ends. At the upper end, the drain has a bottom width of 3 ft. which is gradually increased to a width of 14 ft. at the outlet. The drainage area comprises 10,200 acres in Dawn and 750 acres in Sombra. The estimated cost is $9,800 of which $9,201 is assessed against lands and roads in Dawn, and $599 against lands and roads in Sombra. The total cost of the work was $13,046.85.

On report of the proper completion of the work the grant of $1,000 was paid to the Township of Dawn, the initiating municipality.

Michener and Wignell Drain, Humberstone.

The drain begins at the road in front of Concession 3 at the line between Lots 21 and 22, and runs south through Lots 22 and 23 to a point near the lake shore. It there runs across Lots 22 and 21, joining the Michener drain near the centre of Lot 21. Thence the course is south to the lake. The length of the Wignell drain is 18,700 ft. and the length of the Michener drain 2,600 ft.

From the Grand Trunk Railway to the lake the Wignell drain has a bottom width of 16 ft. with an average depth of 7½ ft. The Michener drain has a bottom width of 8 ft. and the depth varies from 3 ft. at the head to 6 ft. at the outlet. The drainage area comprises 2,700 acres. The estimated cost of the work is $10,235. Extra rock work encountered in the excavation brings the entire cost to about $11,500.

I examined the work in the fall of 1914, and on report the grant of $800 was paid to the Township of Humberstone.

North-East Drain, Logan.

The drain with numerous branches commences in the 14th Concession of Ellice, and extends through the Township of Logan, to a sufficient outlet on Lot No. 11 in the 8th Concession. The length of the main drain is about six miles, while the combined length of ten branch drains is about 8 miles. The drainage area which comprises an area of 4,600 acres, was formerly a swamp. In 1898 partial drainage for this swamp was provided. In clearing up the land the muck was burned off and the drainage system went up in smoke. Again in 1903 drainage was provided. The new drains disappeared as did the former ones. The effect of the two burnings was to reduce the elevation of the swamp to such an extent that the original outlets were not sufficient for effective drainage. In 1911 the present scheme was undertaken. The work comprises the deepening of the main outlet and the deepening and enlarging of all the drains in the system.

The estimated cost of the entire work was $11,187.40, of which $2,542.70 is assessed against lands and roads in Ellice, and $8,644.70 against lands and

roads in Logan. The final cost of the work exceeded the estimate by some $539.00, making the full cost of the work $11,726.40. The work was examined by Mr. Geo. Hogarth, Assistant Engineer of the Department, on Oct. 15th, 1914, who reports the work fully completed. On the recommendation of the Department of Public Works the grant of $1,000.00 voted in aid of this work, was paid to the Township of Ellice, the initiating municipality.

Pelee Point Marsh Drainage, Mersea.

In 1894 the Township of Mersea undertook the reclamation of a large area of marsh land on Pelee Point by a banking and pumping scheme at a cost of $22,844. In 1903 a large expenditure was incurred through necessary improvement. In the year 1910 it was found necessary to divide the original drainage area into two separate systems called the East scheme and the West scheme, and improvements were carried out on each under separate by-laws.

Under By-law No. 815 the West scheme was improved at an estimate cost of $14,490. Under By-law No. 825 the East scheme was improved at a cost of $9,596.

When the present debentures are paid off this work will have cost in principal and interest, $155,300. The lands affected comprise an area of about 4,000 acres. Along with this tremendous construction cost is the cost of pumping, which amounts to $3,000 per year.

On report of the full completion of the work the grant of $1,500 voted in aid of this drainage scheme was paid to the Township of Mersea.

Stewart-Proulx Drain, Lochiel.

The drain commences at the south side of Lot 17 in the 2nd Concession and runs north-east through the 2nd and 3rd Concessions, a distance of four and one-quarter miles, joining La Grasse Creek on Lot No. 6. A branch of the drain extends west across Lots 15, 16 and 17 in the 2nd Concession, a distance of one mile.

The estimated cost of the drain was $7,100, the entire cost being assessed against lands and roads in Lochiel. I examined the drain in the fall of 1913 and found the work completed in a satisfactory manner.

On the recommendation of the Department of Public Works the grant of $800.00 voted in aid of this drain was paid to the Township of Lochiel.

Stoney Creek Drain, Cornwall.

The drainage scheme was initiated by the Township of Cornwall under By-law No. 840, and the main drain and branches will benefit and reclaim 1,374 acres of the total drainage area of 4,728 acres situated in the 7th, 8th and 9th Concessions of Cornwall Township. The upper end of the work is at Mud Lake on Lots 30 and 31 in the 9th Concession and the drain extends across the 8th and 7th Concessions a distance of 42,653 ft., while the branch drain commencing on Lot 22 in the 9th Concession and running easterly is 7,526 ft. long. The work is completed and the actual expenditure to date has been $18,885. On recommendation of the Department of Public Works the grant of $1,500.00 voted in aid of this drainage work was paid to the Township of Cornwall.

Toulouse Drain, Dover.

This drain commences at the road between Lots 12 and 13 at the centre of the 7th Concession and runs west and north through the 7th and 8th Concessions, reaching an outlet at St. Luke Bay, part of Lake St. Clair.

The bottom of the drain being below lake level the work had to be done with a dredge. The drain is from 24 to 30 ft. wide and from 6 to 8 ft. deep.

The estimated cost of the drain was $8,186, but the final cost was $9,390.19. The entire cost was assessed against lands and roads in the Township of Dover under By-law No. 470.

I examined the work in September, 1914, and on report, the grant of $500.00 was paid to the Township of Dover.

Respectfully submitting the above,

I have the honour to be,

Sir,

Your obedient servant.

A. J. Halford.

REPORT OF CHIEF BOILER INSPECTOR.

TORONTO, November 23rd, 1914.

HON. F. G. MACDIARMID,
Minister of Public Works, Parliament Buildings,
Toronto, Ont.

DEAR SIR,—I have the honour to submit my second annual report of the work done by the Steam Boiler Branch of the Department of Public Works during the year ending October 31st, 1914.

The following is a summary of the examination of designs of boilers and accessories, also shop inspections during construction of registered boilers, and the inspection of used boilers shipped into the Province or extensively repaired:

Drawings and specifications of boilers surveyed and registered, 314.

Drawings and specifications of boiler accessories surveyed and registered, 195.

Drawings returned to the manufacturers for corrections, 201.

Registered boilers inspected by the Department during construction, 478.

Plates examined, 2,963.

Plates rejected, 9.

Registered boilers inspected by insurance companies in Canada, outside the Province, 3.

Registered boilers inspected by insurance companies in United States, 37.

Registered boilers inspected by insurance companies in England, 10.

Used boilers inspected in Ontario, 294.

Used boilers inspected in Canada, outside the Province, 6.

Used boilers inspected in United States, 42.

Used boilers inspected and refused admission to the Province, 12.

Used boilers inspected and repaired under inspector's directions, 69.

Used boilers inspected, the pressures for which were reduced, 170.

Used boilers inspected and condemned, 16.

Certificates issued for new boilers, 478.

Certificates issued for used boilers, 275.

Fees received for surveying designs of boilers, $2,503.00.

Fees received for re-surveying designs of boilers, $350.00.

Fees received for surveying designs of boiler accessories, $642.00.

Fees received for re-surveying designs of boiler accessories, $57.00.

Fees received for shop inspection of new boilers, $4,130.00.

Fees received for inspection of used boilers, $1,443.28.

Expenses charged in addition to fees for boilers inspected outside the Province, $502.29.

Customs duties refund, $15.98.

The present regulations for the construction and inspection of boilers gives this Department no jurisdiction over boilers after they have been installed, unless extensive repairs or alterations are made. In this way the owner or user of a boiler may operate or cause to be operated, a boiler in an unsafe condition, and unless such a boiler is extensively repaired or altered we have no right to interfere or inspect the boiler in order to ascertain what the safe working pressure ought to be. If the owner of a boiler in a dangerous condition states that he will not repair it, we have no power to compel him to do so, although he is jeopardizing the lives of the public in this respect.

I regret to report that during the year, the following boiler explosions were

reported to this Department. The notification of these accidents, however, was incidentally communicated to this Department, because there is nothing in our Act which compels the owner or any other person to notify us of such casualties, and our examinations and investigations which were carried out in several cases were solely for the purpose of obtaining information that might be useful to the Department at a future date, as a study of the failures of steam boilers and supplementary apparatus, as well as of the defects encountered in the course of actual inspection teaches many valuable lessons which may be used as a precedent:

On June 25th, a boiler exploded in the Howick Hall Building, Ottawa, resulting in the death of three men, and seriously injuring twelve, also destroying property to the extent of $100,000. The failure of this boiler was apparently due to excessive pressure, and an inherent weakness in the manhole reinforcement ring, in which the fracture which caused the explosion commenced. From the indications of the remains of the boiler after the explosion, it appeared that there was plenty of water in the boiler at the time of the accident. How much that pressure was, could not be ascertained. The safety valve was stated to have been unreliable, previous to the explosion, and had been set to blow-off at 70 pounds. The steam gauge movement was found to be out of order, the quadrant being forced out of the movement frame. Under these conditions the gauge would not register, but whether or not it had been rendered useless by the explosion could not be proven. I venture to say, however, that the gauge was in an improper working condition previous to the accident.

On June 25th a steam boiler exploded in Oshawa, seriously injuring two persons; the injuries to one of the men subsequently proving fatal. Information of this fatality was, I regret to say, received by this Department at too late a date to make an examination and investigation of the exploded boiler.

On September 11th, a portable boiler, used for operating a threshing outfit, exploded on the farm of Mr. Samuel Lindsay, Kincardine, Ont., killing the owner, and inflicting very serious injuries to the deceased man's father and another victim, who were both assisting to run the machine at the time of the disaster. Upon examination we found that the plates in the furnace of the boiler had corroded and wasted generally to such an extent that it collapsed purely from weakness. According to our calculations the boiler should not have been operated at more than 25 pounds, whereas 100 pounds was being carried at the time of the accident. Furthermore, the boiler had just been purchased by the deceased from a second-hand dealer one week previous to the accident.

On June 12th a blow-off tank exploded in the boiler room of Bowes Limited, Toronto, killing the engineer in charge, namely James Perry, and seriously injuring two other workmen, besides causing considerable damage to the building. The blow-off tank was used for the purpose of receiving the water which was blown out of the boilers, and was not fitted with an exhaust pipe leading to the atmosphere, which would have relieved the steam pressure and prevented the accident.

During the month of July, the engineer in charge of the Tough-Oakes Mines, Swastika steam plant, was killed there by an explosion of some part of a boiler or supplementary apparatus under pressure. Details of this accident are also lacking; it was not investigated by this Branch, owing to the explosion not being brought to our notice at the time.

On the 13th of October a cast iron stop valve on one of the boilers in the plant of the Greene, Swift Company, London, exploded under steam pressure of 110 pounds. The engineer in charge was seriously scalded, and at the time of

writing he is in a precarious condition. The failure of the valve appeared to be due to a blow-hole in the casting which had not been detected until after the valve had fractured.

On October 28th, an explosion occurred in a steam line carrying a pressure of 110 pounds, belonging to the firm of Flett, Lowndes, Limited, Toronto. On examination we found that the accident had been caused by water hammer and a defective layout of piping, resulting in serious injury to a fireman and considerable loss of property to the owner.

A number of other accidents besides the above mentioned occurred during this year, of which we have no records. The boilers and appurtenances which exploded were not subject to our inspection, and as already stated we have no jurisdiction in the protection of public life and property in this connection. It would be impossible to correct at once by further legislation all defects and improper conditions which at present exist, but I am firmly convinced that many of the more serious accidents which occur from time to time in our Province could be prevented and consequently the number of fatalities reduced, if the boilers were periodically examined by qualified inspectors who use their abilities entirely for this purpose.

During the month of June a conference was held in these offices with representatives from British Columbia, Saskatchewan, Quebec and Nova Scotia present. The object of this conference was to compile a uniform set of Regulations for the various provinces, as the existing laws governing the construction of boilers in the various provinces are dissimilar, and consequently a boiler in one province would not be accepted in another without being penalized in pressure. A proposed set of new Rules was drawn up accordingly, and at the time of writing we are settling various matters in this connection, which had to be left over at the conference, to be taken up by correspondence. When the proposed Regulations are completed they will be submitted by the various members present at the conference for the approval of their respective Governments.

Like last year we have had many requests from steam users to inspect the boilers installed in their works, and after explaining to those firms that our Act only dealt with new boilers and boilers extensively repaired, sold, or exchanged, and that all other boilers were exempt from inspection, they waived the exemption, and paid our inspector's travelling expenses from Toronto and return together with the fee prescribed by law for the inspection of boilers which come under the Act, and we issued to them our official inspection certificates, with the maximum working pressure stated thereon, which pressure is calculated from the formulæ contained in our Regulations.

In concluding my report, I desire to express my appreciation for the support given me by the Deputy Minister of Public Works in connection with enforcing the provisions of the Steam Boilers Act, also to the entire staff of the Steam Boiler Branch for their co-operation in carrying out the work of inspection and surveying of designs.

I trust that my efforts have been in accordance with the policy of the Department.

I have the honour to be,
Sir,
Your obedient servant,

D. M. Medcalf,
Chief Inspector of Steam Boilers.

REPORT OF SUPERINTENDENT COLONIZATION ROADS.

To the Honourable F. G. Macdiarmid, Minister of Public Works.

Sir,—In the absence of Mr. George W. Bennett, Superintendent of Colonization Roads, who has gone with the first Canadian Contingent to take part in the War now raging in Europe, I have the honour to present the following report on the work done in the Colonization Roads Branch, during the fiscal year ending October 31st, 1914.

The sum of $483,072.46 has been expended in the construction of Colonization Roads and the work has been generally satisfactory as the appended detail will show, representing 469 miles of new road cut, cleared, stumped, 1,591 miles of improvements and repairs, consisting of grading, gravelling and ditching, on roads which had been previously opened but not considered in condition for general traffic, and in addition to the above some 238 bridges were constructed.

This year one hundred and thirty-five (135) Municipalities availed themselves of the opportunity granted by the Government to pass By-laws for Road Construction under the "Colonization Road Act" and expended the sum of $243,-908.34, one-half of which was contributed by the Department of Public Works.

A number of "Trunk Roads" were also opened up, in Algoma, Sudbury, Manitoulin and Kenora Districts. These were located and laid out by the Engineer of the Department, Mr. Chas. H. Meader, special detailed reports of which are herewith attached.

A statement in detail of the expenditures made during the year also accompanies the report.

All of which is respectfully submitted.

I have the honour to be,

Sir,

Your obedient servant,

M. P. Doherty,

Accountant Colonization Roads.

NORTH DIVISION.

Aberdeen, Concessions 2 and 3, west from east boundary.—This road was improved by being widened from 12 to 21 ft. Many boulders were removed and the road graded and ditched a distance of 80 rods.

Aberdeen, Lots 10 and 11, Concession 4.—A side hill was cut down, 3 culverts built, considerable rock was blasted out, and 80 rods of road repaired.

Aberdeen Additional Road Lot 2, Concession 3.—A very steep and long hill improved by grading 40 rods and removing the boulders.

Allen, 10th sideroad, Concessions 4 and 8.—Improved by grading and gravelling 120 rods and constructing one new culvert.

Alexander Portage Road.—One-half mile of road repaired by ditching 39 rods, grading and shaping 100 rods and building two new culverts.

Ansonia Road west from Townline Lefroy and Thessalon.—Clearing, grading, gravelling and ditching one-half mile of old road.

Assiginac Township Roads.—On the sideroad between Lots 9 and 10, 300 rods of new road were constructed between Concessions 12 and 14; 125 rods were cleared, stumped and grubbed; 300 rods graded 22 ft. wide and 25 rods covered with gravel. Lot 14, Concession 1, 25 rods graded, 155 rods crowned with gravel. The South Bay Mouth Road, Lots 31 and 33, was improved by spreading gravel over 200 rods.

Assiginac, 16th Concession on hill, and hill on Concession 15.—Seventy-five rods of new road were graded and gravelled. A fill was made consisting of 15 yds. of stone and 5 yds. of earth.

Assiginac and Sheguiandah Townline to Bay in front of Lots 48 *and* 49.—Seventy-five rods of new road cleared, stumped, grubbed and graded; 15 rods covered with gravel and a fill of ten yards of stone.

Assiginac and Tehkummah Townline, 8th Concession, 5th sideroad.—One hundred and fifteen rods of old road crowned with earth and gravel and 25 rods graded 22 ft. wide.

Aubrey Township Roads.—Work in this Township was performed on Lot 4, Concession 4, Lots 8, 20, 21, 22, Concession 6; and Lots 9, 19, 20 and 23, Concession 5. Twenty rods of old road were graded, crowned with clay and one wooden culvert constructed; 480 rods of new road were cleared, stumped and grubbed, 170 rods were graded and covered with clay; 2 new wooden bridges having a span of 24 and 18 feet, respectively, were built and three wooden culverts were placed; 50 rods of corduroy laid and covered with clay and 350 rods of ditching; two culverts were filled in and two large hills cut down.

Baldwin Roads.—One mile of road east and south of Espanola Station was well improved, 25 rods stumped, 300 rods graded, 75 rods crowned with earth and two wooden culverts constructed.

Balfour Township Roads.—Two miles of old road on the boundary of Balfour and Dowling, across Concessions 5 and 6, were graded 16 ft. wide, 160 rods cleared 35 ft. wide, 6 wooden culverts placed and four miles of ditching; repaired one-half mile between Lots 11 and 12 by clearing, stumping, grading and ditching, two wooden culverts built. Concession 2, Lots 1 to 4, 2 miles of old road repaired by grading 640 rods a width of 16 ft. and placing 7 wooden culverts; 25 rods of ditching. On the north boundary from Lot 5, 1½ miles were graded and ditched and 5 wooden culverts built.

Batchewana Road.—One mile of old road improved by blasting out boulders, stumping 160 rods, grading 200 rods, placing 7 cedar culverts and making a fill of 14 cu. yds. of gravel on a heavy hill.

Barrie Island Roads.—*15th side road Concessions* 6 *to* 8—Seventy-five rods of new road gravelled, a fill of 15 yds. of stone and one wood culvert. On the Gore Bay to Barrie Island Road, Lots 28 and 29, Concession 8, 150 rods of old road were improved by crowning with stone, 10 rods graded and 30 rods ditched.

Batchewana Bay Road.—In the Townships of Fisher and Tilley, 3½ miles of old road improved by clearing 50 rods, stumping and grubbing 800 rods, grading 60 rods, spreading 320 yds. of gravel; building one cedar bridge over Black Creek, span 16 ft., placing 6 cedar culverts and cleaning 164 rods of ditch.

Basswood Lake Road, east end.—Lot 1, Day Township, and Lots 11 and 12, Gladstone Township—2½ miles of old road improved by widening and clearing the bush on each side, cleaning out the ditches, renewing 9 wooden culverts and gravelling 120 rods.

Bellevue Station—Goulais Bay Settlement Road.—A new road 3¾ miles in length on Section 29, 30 and 33 Vankoughnet Township was opened up to give

access to Bellevue Station; 824 rods were cleared and stumped through a hardwood bush, 934 rods graded, 286 rods gravel, clay fill 395 cu. yds., gravel hill cut 580 cu. yds., clay sidehill cut 1,571 cu. yds., 2 wood culverts; 18 ft. cedar bridge resting on cedar cribs that are partly filled in with stone. A piece of old road, Section 34, was brushed 6 ft. on each side for a distance of 240 rods, 55 rods graded, 120 yds. gravel spread, 5 cedar culverts built and 360 rods ditched.

Billings and Carnarvon Townline.—Gravel was spread a width of 5 ft. on 130 rods on the Mindemoya and West Bay Road, in front of Lots 23 and 24, and one wooden culvert was placed.

Bidwell Township Roads.—One hundred and sixty rods crowned with gravel on the 5th sideroad between Concessions 2 and 4, 90 rods graded and gravelled in front of Lots 7 and 8, Concession 8, and 175 rods gravelled on the 10th sideroad, Concessions 4 to 6, and one stone culvert.

Billings Township Roads.—One hundred and sixty-five rods of gravel on the 20th sideroad, Concessions 8 to 10. On Lot 24, Concession 1, 50 rods graded and 60 rods crowned with earth and gravel. Rock cut 22 yds., rock fill 30 yds., earth fill 25 yds., improving a side hill. The 20th sideroad near Concession 10, 125 rods crowned with gravel.

Billings and Allen Townline, Concessions 12 and 14.—Seventy rods graded and surfaced. Twentieth sideroad, Concessions 16 to 18, 75 rods graded, and 65 rods surfaced with gravel. There was also 200 rods graded and four small culverts constructed.

Birch Lake Road, east end.—One hundred and sixty rods graded and covered with gravel; through a very heavy clay mixed with quicksand on Lots 11 and 12, Concession 6, Hallam.

Bright, Concession 5, west to Lot 3.—Two miles of road were graded across Lots 3, 4, 5, and 6, 24 ft. in width; an earth cut 200 cu. yds., and the road well ditched.

Bright, Concession 5, east from boundary.—Two and one-half miles graded 26 ft. wide and 100 rods covered with gravel across Lots 12 to 8 inclusive.

Burpee Township Roads.—Blind line between 20th and 25th sideroads, 115 rods crowned with stone and one wooden culvert. Sixth Concession between 20th and 25th sideroads, 75 rods crowned with earth, 3 culverts repaired and two fills made, (1) 100 yds. stone, (2) 100 yds. earth. Concession 8, between 20th and 25th sideroads, 75 rods surfaced with gravel and one wooden culvert placed. Tenth sideroad, between Concessions 8 and 10, 50 rods graded, 110 rods surfaced with gravel, 1 stone culvert and 5 rods ditching; 8th Concession, between 10th and 15th sideroads, blasting top of rock hill and filling at bottom with rock and earth; 100 rods graded, 65 rods covered with earth and gravel, cut 25 yds. rock, fill 50 yds. rock; fill 50 yds. earth. Lots 35 and 36, Concessions 4 to 6, filling in at foot of hill with 300 yds. rock and 100 yds. earth, surfaced 60 rods with earth and gravel.

Broder Township Roads.—Two and one-half miles well graded 16 ft. wide on the old Long Lake Road. On the road from Long Lake to Trembley's Corner, 200 rods graded, one mile ditched; 4 wooden culverts and one 16 ft. wooden bridge. McFarlane Lake Road, from Trembley's Corners, 2½ miles graded and ditched, 5 wooden culverts placed and two 18 ft. wooden bridges built. Lot 6, Concession 4, ¾ mile of new road cleared, stumped, graded and ditched and three wood culverts built. Lot 12, across Concession 5, ½ mile of new road cleared and 3 bridges constructed. Lot 12, Concession 4, one mile of old road cleared, stumped, graded and ditched, 3 wood culverts placed. Across Lot 8, Concession 4, ½ mile of new road cleared, stumped, graded and ditched, and two wood culverts built.

Caribou Lake Road, east and west, Lots 11 *and* 12 *Concession* 1, *Plummer.*—Two hundred and eighty rods surfaced with gravel through a swamp which had been corduroyed, and 240 rods brushed 15 ft. wide on each side.

Campbell, 25th sideroad between Concessions 8 *and* 10.—One hundred and twenty-five rods old road covered with gravel, 10 rods graded, 25 rods cleared and one wooden culvert placed.

Campbell 20th sideroad, Concessions 8 *to* 10.—One hundred rods new road graded, 25 rods covered with gravel and one wooden culvert.

Campbell and Carnarvon Townline, Concessions 14 *to* 16.—Two hundred rods old road covered with gravel and one wooden culvert.

Carnarvon, 4th Concession past Hopkin's.—A rough and stony piece of the Lake Shore Road, Lots 12 and 13, was improved by grading 75 rods and 80 rods surfaced with gravel.

Capreol Township Roads.—Concession 3, Lots 4 and 5, one mile of old road graded, 160 rods ditched and one wood culvert placed. The west boundary across Concession 1; one mile of old road graded and 160 rods ditched. Lots 5 to 9, Concession 2, 1½ miles old road graded and ditched and five wood culverts constructed. Lots 10 and 11, Concession 1, one mile old road graded, 480 rods ditched and two wood culverts. Lots 10 and 11, Concession 3, ½ mile of new road cleared, stumped, graded and ditched, and two new culverts. Lots 10 and 11, Concessions 2 and 3, ½ mile new road cleared, graded and ditched, and one 16 ft. wooden bridge erected. South boundary across Lots 1 and 2, ¾ mile graded, 320 rods ditched, and two wooden culverts. Concession 2, Lots 1 to 6, ½ mile old road cleared, stumped, graded and ditched, 4 wooden culverts and one 20 ft. wooden bridge.

Cobden Township Roads.—Lots 3 and 4, Concession 4, ½ mile of new road was cleared, stumped and grubbed, 80 rods graded 22 ft.

Cockburn Island Road.—The 8th Concession between 5th and 10th sideroads, and the 10th sideroad between Concessions 6 and 8, 210 rods graded, 50 rods crowned with earth, 40 rods ditching and one wood culvert. This was a heavy piece of work owing to the stony nature of the ground.

Colin Campbell's to bridge.—One hundred rods of old road were graded and covered with gravel.

Conmee Township Roads.—Concession 3, Lot 2, ½ mile of new road was cleared, stumped and grubbed. Concessions 4 and 3, between Lots A and 1, one mile of new road was cleared, stumped and grubbed, 28 rods of corduroy laid and three wooden culverts placed. Concession 3, Lots A to 2, ½ mile of new road cleared, stumped and grubbed, and one wooden culvert constructed. Lots 1 to 3, Concession 7, one mile of old road graded and crowned with earth, 100 rods ditched and one hundred yards of earth removed. Between Lots 3 and 4, across Concession 2, a new road 120 rods long was cleared, stumped and grubbed; and on it 20 rods of corduroy, 4 cedar culverts and one 16 ft. cedar bridge were placed. Between Lots 4 and 5, Concession 3, ½ mile of new road cleared, stumped and grubbed, 40 rods graded and surfaced with earth and six wood culverts. Concession 1, Lot 1, ½ mile of new road cleared, stumped and grubbed, 3 cedar culverts and one hundred yards of earth removed.

Cuthbertson Road, Concession 7.—In Plummer Township, ½ mile of new road constructed, ditched on both sides and 311 yds. of gravel spread over 80 rods.

Cuthbertson Road, Concession 6.—Lot 9, Plummer, ¾ mile of old road on stony ground was improved by removing the stones, grading 80 rods and covering 160 rods with gravel.

Cuthbertson Road north of Concession 6.—Lot 8, Concession 6, Plummer, ½ mile of old road was re-graded and ditched and covered with a good quality of gravel.

Coppercliff and Creighton Road.—Lots 1 to 5, Concession 5, Creighton, 2½ miles of new road were cleared, stumped, graded and ditched. Five wood culverts and one 16 ft. wood bridge were built.

Dawson Road Township Roads.—Tenth Concession, 25th to 30th sideroad, and the 25th sideroad, Concessions 10 and 12, 200 rods new road gravelled, 140 rods cleared, 75 rods graded and one stone culvert. Concessions 1 and 2, Lots 14 to 30, 4 miles of new road were cleared, stumped and grubbed and four tamarac culverts placed.

Dean Lake and Patton Road.—Lot 10, Concession 3, Patton, ¼ mile of old road was brushed and graded, 40 rods gravelled and three wood culverts built.

Dean Lake to Thompson's Bridge.—Sections 16 and 18, Thompson, 1½ miles of road graded, 173 rods gravelled, one wood culvert, a quantity of boulders removed and considerable drainage.

Desbarats Lake Road.—On Concession 2, Lots 30, 35, 36, Johnson, and Lot 8, Desbarats, 2½ miles of old road graded, 40 rods gravelled, 2 wood culverts and the ditches cleaned.

Dorion Township Roads.—Between Lots 4 and 5, across Concession 4, thence west ½ mile between Lots 10 and 11, ½ mile of new road cleared, stumped and grubbed, and 1¼ miles of old road graded and crowned with earth, and five wood culverts placed. Concession 3, Lots 6 to 10, one mile of old road improved, 160 rods graded, 160 rods crowned with earth, 100 rods ditched and one cedar culvert. Lot 9, across Concession 4, one mile of old road graded and crowned with earth, 40 rods ditched. Lot 8, Concession 4, to Lot 11, Concession 5, ½ mile of new road cleared, stumped, graded and surfaced, 2 miles of old road graded and surfaced. 6 cedar culverts. Lots 7 and 8, Concessions 4 to 6, one mile of old road graded and surfaced, one cedar culvert and 160 rods re-surfaced with gravel. Lots 5 and 6, Concession 5, Lot 8, Concession 7, 2¾ miles of old road graded and surfaced with earth, cut down one hill, removing 330 yds. of clay and placing 10 culverts. Lots 2 and 3, Concessions 1 and 2, ½ mile of new road cleared, stumped and grubbed, 80 rods graded and surfaced with earth and two wooden culverts built. Lots 4 to 6, Concession 6, 1½ miles of new road cleared, stumped and grubbed, 160 rods of old road graded and crowned with earth and three jack-pine culverts.

Diamond Lake Road.—On the shore of Diamond Lake from Lots 4 to 8, Johnson Township, one mile of new road was constructed, 240 rods cleared 66 ft., 80 rods stumped and grubbed 66 ft., and 80 rods crowned with gravel.

Espanola Station, north.—Lots 7 and 8, Concessions 3 and 4, Baldwin, cleared 50 rods, stumped and grubbed 40 rods, corduroyed 135 yds., 2 timber bridges, 20 ft. span erected.

Eton Township Roads.—Between Lots 6 and 7, Concession 1, south of railway track, ½ mile new road west on boundary, one mile of new road between Lots 10 and 11, Concession 2, ½ mile between Lots 9 and 10, Concession 4, and a bridge. Lot 5, Concession 3, 2 miles of old road were improved and 2½ miles of new road built. On the old road one mile was cleared, 2 miles stumped, graded and crowned with earth, clay and gravel, 5 wood culverts, one wooden bridge, 20 ft. span; 600 yds. of corduroy covered with clay, ¾ mile of ditching. On the new road 2½ miles were cleared, stumped and graded, 2 miles crowned with clay and gravel, 3 wooden culverts, two 16 ft. wooden bridges, 400 yds. of corduroy covered with clay and two off-take ditches.

Fairbank and Creighton Township Roads.—Lots 5 to 1, Concession 6, Creighton, 2½ miles of new road opened up through a green bush, cleared 800 rods 50 feet, stumped 400 rods 40 ft., graded 80 rods 16 ft., ditched 80 rods and two wood culverts.

Fossil Hill, west.—One hundred and sixty-five rods of old road were gravelled, 50 rods graded and one culvert repaired on the Manitowaning and South Bay Mouth Road, in Assiginac.

Galbraith, Lot 6, Concession 2.—One mile of new road was cleared 66 ft. wide and 280 rods stumped and grubbed 35 ft. wide, crossing Lots 7 and 8.

Galbraith Road, Concessions 1 and 2.—Three-quarters of a mile of new road was opened up through a flat cut; on it was required two 12 ft. cedar bridges erected on cedar abutments filled with stone, 60 rods cleared, 80 rods stumped and grubbed, 240 rods graded and three cedar culverts built.

Galbraith, Broads Road.—One-half mile of new road opened up through a swamp on Lot 4, Concession 2, 160 rods cleared, 160 rods stumped and 60 rods graded.

Gillies Township Roads.—Between Lots 7 and 8 to the Agricultural grounds, 80 rods of old road were graded and shaped and forty rods of new road cleared, stumped and graded. Concession 4, Lots 8 and 9, ½ mile of new road was cleared, stumped and grubbed and three wood culverts built. Between Concessions 5 and 6, Lot 9, 45 rods of new road cleared, stumped, graded and crowned with earth 24 ft. wide. Gillies and Pearson Townline, across Lot 1, ½ mile of new road cleared, stumped and grubbed. Concession 3, Lots 7 and 8, ½ mile of old road was graded and crowned with earth. Across Lots 4, 5, 6, Concession 5, 480 rods were graded and covered with clay, and seven plank culverts placed. Concession 2, Lots 9 to 11, ¾ mile of new road cleared, stumped and graded and 40 rods of ditching. Hymer Road, Concession 4, Lots 6 and 7, two hills cut down, 600 yds. of earth removed, 40 rods graded and covered with clay and one plank culvert built.

Glen Otter Road.—Sections 21 and 22, Lefroy Township, 80 rods graded and gravelled, a hill cut down and a fill of 1,230 yds. made to raise the approach to the C. P. R. crossing. This work required the raising of a bridge 1 ft. 6 in.

Gordon, East Bluff.—One hundred rods graded and 75 rods gravelled on Lots 1 to 3, Concession 14, Gordon.

Gordon Township, Sand Hills.—Removing 200 yds. of earth on top of a hill and filling at the bottom and covered it with gravel, thus improving 60 rods on the Gore Bay to Poplar Road, Concessions 4 and 6, Gordon.

Gore Bay to Hope's Hill.—One hundred and twenty-five rods graded and covered with gravel, on the Townline of Gordon and Allan, Range A, Lots 1 and 2.

Gore Bay to Ice Lake.—One hundred and twenty-five rods graded, 150 rods gravelled, a fill of 5 yds. of stone and 15 yds. of earth and one wood culvert on Concession 8, near Allan and Gordon Townline.

Gold Rock Road.—Seven miles of an old mining road improved by clearing out the sides 9 ft., stumping and grubbing 4 miles, grading 3½ miles, gravelling 3 miles, corduroying 50 yds. and covering it with gravel, ditching 3 miles and erecting 5 wooden culverts.

Gorham, between Lots 8 and 9, Concessions 1, 2, 3.—Four hundred and sixty rods of new road were cleared, stumped, graded and surfaced partly with gravel, 144 rods ditched, 5 cedar culverts. On the old road 100 rods were stumped and grubbed, 400 rods graded, 420 rods surfaced with earth and two stone and two wood culverts built.

Gorham, between Lots 6 and 7, Concessions 1 to 6.—Two miles of new road across Concessions 2 and 3 were cleared, stumped and grubbed and one mile graded and surfaced with earth. Two hills were cut down and 8 wood culverts placed.

Gorham, between Lots 12 and 13, Concessions 2 to 4.—One mile of new road cleared, stumped, surfaced and ditched, and three tamarac culverts constructed.

Gorham, between Concessions 3 and 4, Lots 14 to 18.—Two miles of new road were cleared, stumped, grubbed; 400 rods graded and surfaced; 1,000 rods of ditching and three cedar culverts built.

Gorham between Concessions 4 and 5, Lots 14 to 18.—One mile of new road cleared, stumped and grubbed, one mile of old road graded and surfaced (one-half earth and one-half gravel), 160 rods ditched and 3 culverts constructed.

Gorham, between Concessions 5 and 6, Lots 14 to 18.—One mile of new road cleared, stumped and grubbed, ½ mile graded and surfaced, 5 tamarac culverts and one mile of old road graded and crowned.

Goulais Bay Settlement Road.—Work on this road was performed from the steel bridge northwards, one mile being gravelled, 130 rods graded and covered with gravel, a washout filled in with 22 cu. yds. of stone, a metallic culvert 65 ft. in length placed so as to prevent the washing out of the road and two cedar culverts built.

Goulais Bay Mission Road.—This road is through low, swampy land in Fenwick Township. One hundred and twenty rods of new road through a hardwood brush were cleared, stumped and grubbed and 840 rods of old road were repaired, 20 rods being stumped and grubbed, 25 rods of corduroy being laid and covered with earth and 180 rods being well ditched.

Government Road, Concessions A and B, Sheguiandah.—Lots 6 to 15, 760 rods cleared of brush and stones and prepared for grading, 400 rods stumped and grubbed, and covering over some 80 rods of rock with earth. Two wood culverts were built.

Galbraith Township, Lot 8.—A beaver dam was destroyed to keep the water off the road.

Goulais Bay Road repairs.—Several small washouts or ruts were filled in along this road.

Hagar Township Roads.—Between Concessions 2 and 3, on Lot 9, ¾ mile of new road was opened up and graded, 80 rods were stumped, grubbed and ditched, 2 wood culverts placed. Lots 6 and 7, Concession 5, ¾ mile of new road was cleared and one 30 ft. timber bridge constructed. Between Concessions 5 and 6, across Lot 3, ½ mile of old road graded and ditched. Between Lots 11 and 12, across Concessions 5 and 6, 2 miles of road graded by finishing repairing, stumping and grading, 160 rods ditched and 3 wood culverts built. Hagar Road, west to Townline, ¾ mile graded and two stone culverts placed. Between Concessions 4 and 5, Lots 10 and 11, 12 miles ditched and one mile graded. Between Lots 8 and 9, Concessions 6, ¾ mile of old road cleared and graded, 160 rods ditched, one 16 ft. timber bridge. Between Lots 12 and 13, south into Appleby Township, ¼ mile of old road stumped, graded and ditched, 3 wood culverts constructed and ¼ mile of new road opened up, 40 rods being cleared, 40 rods stumped and 10 rods graded. Between Concessions 1 and 2, one mile of new road cleared to give outlet to bridge on the Veuve river, 80 rods stumped and graded, 400 yds. ditched and 3 wood culverts placed.

Hanmer Township Roads.—Concession 3, across Lots 4 and 5, clearing, stumping, grading and ditching 2 miles of old road. Concession 2, Lots 6 to 12, im-

proved 3 miles of old road by grading and ditching and placing 3 wood culverts. Concession 4, Lots 1 to 4, repairing 1½ miles of old road by stumping, grading and ditching and two culverts were built. Lots 1 to 3, Concession 3, fixing hills, stumping and grading 30 rods and surfacing 240 rods with earth. Concession 3, Lots 8 to 12, clearing, stumping and grubbing 160 rods, filling with brush and timber and covering with clay one mile through low ground, ditching 480 rods and erecting 4 wood culverts. Lots 6 and 7, Concessions 4-5, grading and ditching one mile and building two wood culverts.

Hanmer Rayside Boundary.—Lot 12, ¼ mile of new road cleared, stumped, graded and ditched, and two 8 ft. timber bridges constructed. Hanmer and Blezard boundary, Lots 11 and 12, ¾ mile of new road cleared, stumped, graded and ditched partly through a green bush. One wood culvert placed.

Hallam Road, Concessions 3 and 1.—Grading, draining and general repairs to 2 miles of old road between Lots 9 and 10, Concessions 3 to 1; 6 wood culverts.

Hartman Township Roads.—Lots 3-12, Concession 3, Lot 12, Concession 4, Lots 12 and 13, Concession 5, Hartman, and Lots 1, 2, 3, Concession 3, Zealand. Three hundred and nine rods of old road cleared, stumped, graded, gravelled and ditched, 30 rods of corduroy laid and covered with gravel, and 7 wood culverts built. Three and one-half miles of old road improved, 340 rods stumped, 990 rods graded and gravelled, 8 wood culverts, one 16 ft. timber bridge, 100 yds. of corduroy covered with gravel, 990 rods ditched and 4 small off-take ditches. This makes seven miles of splendid road for this district.

Haviland Sideroad to Gibbs.—Eighty rods regraded, one 18 ft. timber bridge repaired, 20 yds. of gravel spread and 114 cu. yds. of stone fill. The north support of the bridge was washed away and had to be repaired.

Hilton, between Concessions 11 and 12.—Across Lots 4 and 5 one-half mile of new road was cleared and graded.

Hinck's Location, Concession 5.—Across Lots 5, 6, 7, 8, Concession 5, Johnson, one mile of old road graded, gravelled and ditched, 2 hills graded down; 3 small cedar culverts were built.

Hinck's Location, Concession 6.—Across Lot 1 and part of 2, Concession 6, Johnson, 120 rods of new road cleared, stumped, graded and gravelled, and one cedar culvert placed.

Howland Municipality Roads.—Columbus Hill south, 75 rods of old road gravelled. Little Current and Honora Road, Lots 23 and 24, Concession 6, 120 rods gravelled. Lots 6 to 9, Concession 9, 130 rods gravelled. Sheguiandah and Dunlop Road; improving road by cutting down a rock hill and filling at bottom making 30 rods of new road; rock cut 100 yds, fill 200 yds. (rock and earth). Ten Mile Point Road, Lot 20, Concession 10, Sheguiandah, 50 rods of new road graded and gravelled, one wood culvert, 40 yds. stone fill, 25 yds. earth fill. Howland and Bidwell Townline, Lots 2 and 3, 150 rods of old road surfaced with earth and gravel, 100 yds. earth fill, and one wood culvert. Concession 9, 5th to 10th sideroads, 100 rods of old road improved by grading and gravelling, one wood culvert.

Ignace Township Roads.—Road running west of Ignace a distance of 5 miles to stone quarries and saw-mill. Repaired, 1,010 rods old road; stumped 350 rods; cleared, 350 rods; graded and surfaced with cinders and gravel, 305 rods; 50 rods corduroy covered with gravel, 175 rods ditched, 4 wood culverts. New road, 310 rods cleared and stumped, graded 35 rods, gravelled 50 rods, corduroyed 75 yds. covered with gravel, ditching 400 yds.; 4 wood culverts and one 30 ft. timber bridge.

Indian Point Bridge, east.—Lots 22 and 23, Concessions 3 and 4, Gordon. One hundred and fifty rods old road covered with earth and gravel, 80 rods graded and an earth fill of 25 yds.

Iron Bridge and Patton Road.—Concession 2, across Lot 2, Gladstone, straightening an old road by clearing, stumping and grading 80 rods, surfaced 20 rods with gravel and built two wood culverts.

Iron Bridge and Bellingham Road.—Concessions 4, 5, 6, Gladstone, and Concession 1, Parkinson; improving 3½ miles of old road by grading, gravelling and repairing a bad hill, cleared 100 rods, graded 1,040, gravelled 320 rods.

Johnson, Lot 4, Concessions 4 and 5.—Improved a heavy hill by making rock cut 33 ft. x 16 ft. x 4 ft. and making a fill 63 ft. x 22 ft.

Johnson, Boyer Road.—Lot 3, Concession 1, Johnson; improving ½ mile of old road by grading and cutting a sidehill and gravelling and putting a railing on sidehill; graded 49 rods, gravelled 31 rods.

Kagawong, Concession 14, and Range A.—Kagawong north Road across Concessions 5 and 6, Allan Township. One hundred and ten rods of new road stumped and graded and 55 rods covered with gravel.

Kagawong to Ice Lake.—Kagawong to Gore Bay Road, across Lots 7 to 11, Concession 9, Allan. Two hundred and twenty-five rods old road covered with gravel and one timber culvert repaired.

Kerr Road Washout.—Sections 41 and 40 Vankoughnet. Cutting about 300 rods through a green hardwood bush and 100 rods through a burnt plain, making a temporary connection between the new road and old road, graded 350 rods, sidehill cut 342 cu. yds., 14 rods corduroyed and covered with earth.

Killarney to Collin's Inlet.—In Carlyle Township, starting about 5 miles east of Killarney and working towards Collin's Inlet, 500 rods of new road were graded, 400 of which had to be cleared 35 ft. wide, one timber bridge was repaired, 4 wooden culverts built and ten roads of corduroy laid and the sides of the road were brushed out and ditched.

Lawson Township, Joyce's, east.—Lots 6 to 10, Concession 8 Dawson, 175 rods of old road improved, graded 40 rods, gravelled 160 rods, stone fill 100 yds., earth fill 50 yds., one 16 ft. timber bridge.

Lewellyn Beach Road.—One mile of new road constructed through very stony ground, covered with small timber crossing four shore lots on Concession B, near Bear Lake, in the Township of St. Joseph, 320 rods being cleared 66 ft. wide, stumped and grubbed 34 ft. wide, and graded 22 ft. wide; 3 cedar culverts placed.

Lefroy and Plummer, Additional Townline.—Centre of Section 19, 60 rods graded and covered with gravel, 20 rods brushed 15 ft. on each side and 40 rods of ditches cleaned.

Levi Walker's corner to Lake.—Haviland Township, 3 miles of new road through a green hardwood bush cleared, stumped and grubbed; 30 rods graded, 2 cedar culverts placed and five sidehill cuts amounting to 391 cu. yds.

Long Bay to Ice Lake. Lot 25, Concessions 1 and 2, Campbell and Allan Townships, 1¾ miles of new road cleared, stumped and grubbed.

Long Bay to Hope's Hill.—Lots 26 to 30, between Concessions 1 and 2, Campbell, 1½ miles of road covered with a heavy coat of gravel.

Lorne Township Roads.—Lots 10 to 12, Concession 4, 160 rods of old road graded, 75 rods gravelled, fill 50 yds. of earth, one wood culvert built.

Lewis Township Roads.—Opposite Lot 9 and running to Indian Reserve, near Cutler, 3 miles of new road cleared, stumped and grubbed along the river.

Louise Township Roads.—Between Lots 2 and 3, south from the Townline of Louise and Dennison, 1¼ miles of new road were graded with a hand-scraper, 100 yds. crowned with earth, one earth fill 50 yds. and one stone fill 15 yds., and two wood culverts built.

Little Current to Honora.—Commencing ½ mile west of Little Current, in Howland Township, 120 yds. gravelled and 25 rods graded, 25 yds. earth and stone fill and one wood culvert.

Lumsden Township Roads.—Across Lot 7, Concession 1, 160 rods graded and one wood culvert built. Lots 6 to 8, Concession 2, ½ mile of new road opened 35 ft. across Lot 7, 40 rods graded and 60 rods ditched. Lot 2, Concession 5, ½ mile of old road graded and 40 rods ditched. Lot 6, Concession 2, 40 rods of new road cleared, stumped and graded and 160 rods of old road graded, ditched on both sides and one wood culvert. Lots 1 and 2, Concession 1, ⅜ mile of old road cleared, stumped, graded and ditched on both sides.

Lybster Township Roads.—Hillside road Lots 8 to 11, Concessions 5 and 6, 2¼ miles of old road graded and surfaced, earth cut 300 yds. and 2 wood culverts. Lots 1 to 7, Townline of Gillies and Lybster, 3½ miles graded and levelled, earth cut 425 yds., 5 wood culverts. Between Lots 4 and 5, across Concessions 5 and 6, 2 miles of old road graded and surfaced with earth and 220 rods ditched.

Lefroy, Sections 5 and 6, Lots 31 and 32.—One-half mile of old road covered with gravel, 80 rods being graded and four wood culverts built.

Machin Township Roads.—Between Lots 2 and 3, Concession 1, and on Concession 2, Eton and Sandford boundary—1½ miles of old road were put into very good condition by using a grader and cutting down large hills, 2½ miles were cleared 22 ft. wide, 2 miles stumped and grubbed, 2½ miles graded, 2½ miles covered with clay and gravel, considerable corduroy covered with clay, 2½ miles ditched with 6 small off-take ditches; three 16 ft. timber bridges and 6 wood culverts.

Manitou Lake Road.—Lots 46 and 47, Concession 2, Assiginac, 150 rods surfaced with stone 6 ft. wide.

Manitowaning Road to Reserve.—Assiginac Township, 225 rods covered with gravel, 80 rods brushed 20 ft. on each side and 2 wood culverts.

Marks Township Roads.—Across Lot 3, Concession 3, ½ mile of old road graded and surfaced with earth and one wood culvert. Between Lots 4 and 5, from the Townline of Lybster and Marks to Concession 3, 2½ miles of old road graded and surfaced, 200 yds. earth fill and 4 spruce culverts. Lot 7, Concession 2, ½ mile of old road surfaced with earth and 100 rods graded. Between Lots 2 and 3, across Concessions 1, 2, 3, ½ mile of new road constructed and 220 rods of old road graded and covered with earth, one 30 ft. bridge recovered with plank and a fill of 300 yds. of earth.

Marsh River Road.—Sections 29 and 28, Patton, 380 rods cleared, stumped and graded through a brule, 5 rods of corduroy and two wooden culverts.

May, Concession 4, Lots 10 and 11.—One mile of old road repaired by cutting heavy hills and filling at the bottom; filling approaches to two bridges, one with stone and one with clay; 166 rods graded, 20 rods gravelled, 2 small wood culverts and one metal culvert.

May, Concessions 1 and 2, Lots 6 and 12.—One and one-half miles of old road, across Lots 4, 5, 6 graded and ditched, 25 rods covered with gravel through a swamp and five rods stumped 30 ft. wide.

Melgund Township Roads.—Lot 4, Concession 5, Lot 5, Concession 5, Lots 4 and 5, Concession 4. Between Lots 6 and 7, from Concessions 5 to 8, and a new road from Lot 7, Concession 5, to Lot 7, Concession 4, 2½ miles of old road improved and one mile 15 rods of new road constructed, 2 wood bridges 22 ft., timber; 6 wood culverts.

Merritt Township, east of mill near railway.—Lot 3, Concession 4, 80 rods of new road graded, 40 rods being covered with gravel, 20 yds. earth fill, 2 wooden culverts and one 60 ft. timber bridge.

Merritt Township, from Lauthiers'.—Lot 8, Concession 4, Lot 1, Concession 3, 1½ miles of new road completed by removing stone, filling up holes, and digging off-take ditches, 350 rods being graded, 60 rods surfaced with earth and two wood culverts placed.

Michipicoten Roads.—Along the Michipicoten river, from Michipicoten Falls, 4½ miles of old road improved by spreading, where needed, 156 cu. yds. gravel. 117 cu. yds. loam, 36 cu. yds. clay and 6 cu. yds. of rock, clearing out 121 yds. of old ditch and placing a new spruce culvert. From mile 14½ on the railway to Steep Hill Falls, along the Magpie river, 16 rods stumped and grubbed, sidehill cut 20 rods in length, 232 cu. yds., and fill at bottom 9 rods in length, 110 cu. yds. Along the Michipicoten river to Government Dock, ¾ mile of old road was improved by spreading 174 cu. yds. of gravel and putting 5 loads of rock in a washout.

Milltown Road, west.—Lefroy Township. Three-quarters of a mile of old road graded and surfaced with gravel.

Mill Township, Lees' to Bowser's.—Lots 22 and 23, Concession 6, 110 rods of old road were improved by cutting a hill and filling at the bottom, cut 50 yds, fill 60 yds, 25 rods graded and 100 rods covered with gravel.

Mutrie Township Roads.—From Lot 10, Concession 4, ¼ mile east and from the north-west corner of Lot 8, Concession 3, to the north-east corner of Lot 5, Concession 3; thence to north-east corner of Lot 5, Concession 2, to the north-east corner of Lot 4, Concession 2, and Lot 9, Concession 2, 970 rods of old road were repaired, 70 rods being cleared, 105 rods stumped and grubbed, 175 rods graded, 145 rods gravelled, 135 yds. corduroyed and covered with gravel, 4 wood culverts and 2 bridges repaired; 335 rods of new road cleared, stumped and grubbed, 30 rods graded and gravelled, 75 rods corduroyed and covered with gravel, 205 rods ditched and 3 wood culverts built.

McAuley's Sideroad, Assiginac.—Two hundred rods graded and 60 rods crowned with earth and one wood culvert.

McDonald, Alton's Hill.—Section 17, McDonald, ¼ mile of old road repaired by removing boulders and digging ditch on each side, 60 rods graded and 40 rods gravelled.

McDonald Road, Section 20.—Three-quarters of a mile of old road, through a low swamp, was improved by spreading 262 yds. of gravel over 120 rods and clearing out 100 rods 10 ft. on each side.

McCullough's to Sandfield Mills.—Sandfield Township, 400 rods cleared and graded, 60 rods gravelled, one wood culvert.

McPhee Valley Road.—Lot 12, Concession 1, to Lot 11, Concession 2, Galbraith, one mile of old road was improved by grading and being covered with gravel.

Nairn Township Roads.—Three hundred and sixty-five rods of new road were graded and 65 rods covered with earth, cut 500 yds. of earth, fill 300 yds. of earth.

Neelon, Concession 6, *Lots* 9 *and* 10.—One mile of old road repaired by clearing, stumping and grading and ditching 160 rods, 4 wood culverts.

Nipigon Township Roads.—From Nipigon to Lot 13, Concessions 2, 3, 4, 2 miles of new road were cleared stumped and grubbed, one mile graded and covered with earth, 400 rods ditched and three plank culverts.

O'Connor Township Roads.—Townline of Paipoonge and O'Connor, Lot 1, ¼ mile of old road stumped, graded and surfaced with earth and ditched, 40 rods of corduroy covered with clay. Silver Mountain Road, ½ mile of new road cleared and stumped, 80 rods graded, and 4 wood culverts. Lot 7, Concession 1, ¼ mile of new road cleared, stumped, graded and surfaced. Lot 7, Concession 2, ½ mile of new road cleared, stumped and graded, one tamarac culvert. Sideline between Lots 4 and 5, cut down hill at Cedar Creek, making a fill 5 rods long and 4 ft. deep, graded and surfaced 40 rods. Lot 11, Concession 7, ¼ mile of new road cleared, stumped and grubbed and ½ mile of old road graded and covered with clay. Lot 4, Concession 5, ½ mile of new road cleared, graded, stumped and covered with clay, hill cut down and 400 yds. of earth removed.

Oliver Township Roads.—Across Lots 1 and 2, Concession 3, one mile of new road cleared, stumped, graded and surfaced with earth, 320 rods ditched and 3 cedar culverts.

"P" Line Hill.—Concession "P," boundary of Jocelyn and Hilton Townships, 40 rods of new road constructed by cutting a very heavy hill and filling at bottom. Cut and fill 800 yds. of hard clay, graded 30 rods 24 ft., one metal culvert placed, with upper end cemented.

"P" Line Wharf, St. Joseph Island.—From Concession A to shore of Mud Lake, Jocelyn, 80 rods cleared, stumped and grubbed, 280 rods graded through stony ground, 2 wood culverts.

Paipoonge Township Roads.—Between Lots 15 and 16, across Concession 4 and part of 3, 1½ miles of road graded, surfaced with earth and ditched, 5 cedar culverts, 100 yds. of earth removed.

Parkinson and Mississauga River Road.—Lots 9 and 10, Concession 2, Parkinson, ½ mile of old road improved by stumping and grading 80 rods, placing one culvert, filling in holes and improving hills.

Pearson Township Roads.—Between Lots 11 and 12, across Concession 3, one mile of new road cleared, stumped and grubbed, 40 rods ditched, 3 jack-pine culverts and 100 yds. of earth removed. Trunk road to Hymer's; improved 3 miles of old road by grading and surfacing with earth, 960 rods; one stone culvert. Across Lot 9, between Concessions 2 and 3, ½ mile of new road cleared and 80 rods stumped and grubbed. Between Concessions 4 and 5, across Lots 18 and 19, one mile of new road cleared, stumped and grubbed, 2 tamarac culverts built and 100 yds. of earth removed. From Lot 9, east across Concessions 2 and 3, ending on Concession 2, between Lots 9 and 10, 120 rods new road grubbed out and 1½ miles old road graded and surfaced with earth, 2 tamarac culverts. Between Concessions 4 and 5, Lots 11 and 8, ¾ mile cleared, stumped and grubbed, one tamarac culvert.

Perivale to Kagawong.—Lakeshore Road, Concessions 1 to 4, Campbell. 150 rods new road cleared, stumped and graded.

Pike Sideroad towards Manitowaning.—Lots 29 and 30, Assiginac, on the South Bay Mouth Road; 150 yds. of old road covered with gravel, 8 rods ditched.

Prince, Sections 33 and 34.—Repairing a sidehill by making a cut of 121 yds. and a fill of 140 ft. long, 2 x 2, planking sides so as to protect from spring floods; sidebrushed 100 rods 8 ft. on one side, and built one cedar culvert and one 16 ft. cedar bridge.

Prince, Kaye-McLean Road.—Sections 19 and 30, 2½ miles of road improved by removing logs and stumps and levelling; hill cut 10 yards; corduroy 14 rods covered with gravel; 2 cedar culverts.

Prince, Wilson's Road.—Clearing 1½ miles of new road through a hardwood bush, stumping and grubbing 160 rods, grading 68 rods, ditching 146 rods, fill 345 yds., and two box culverts.

Providence Bay to Newhouse.—Lots 11 to 15, Concession 12, Carnarvon, 300 rods of old road covered with gravel.

Poplar to Gore Bay.—Concessions 2 and 4, Gordon, covering 175 rods with heavy coat of gravel.

Plummer Road, Con. 3.—Lot 2, ½ mile of old road graded and gravelled, cut and fill 90 yds., one wood culvert.

Plummer Concessions 3 *and* 4.—Lot 3, ½ mile of new road through swamp cleared and graded.

Plummer, Concession 6.—Lots 8 to 11, 1½ miles of old road, through gravel formation, graded 18 ft. wide.

Plummer, McIver Road.—Lot 10, Concession 6, ½ mile of new road graded 80 rods, having to be cleared, stumped, and grubbed and covered with gravel.

Plummer, Concession 5, *Lot* 3.—Grading 40 rods and covering 20 rods with gravel; building a 50 ft. timber bridge across McGuire's Creek, cedar abutments and stringers, approaches filled with 50 yds. of stone.

Plummer, Additional Road.—Eighty rods of new road stumped and graded through stony and swampy lands, two cedar culverts placed.

Rayside Township Roads.—Lots 9 and 11, Concession 5. Graded 240 rods, surfaced with earth 400 rods, ditched 320 rods; one iron and one wood culverts, lowered one hill and blasted out rock to widen road, thus improving 1½ miles of old road.

Robinson Township Roads.—The 20th sideroad, Concessions 10 and 11; 350 rods of new road cleared and 225 rods covered with gravel. Lot 22, Concessions 11 and 12, cutting down a rock sidehill and filling in on lower side, cut 75 yds.; rock, 25 yds. earth, fill 100 yds. rock and stone, 40 yds. earth, graded 25 rods, surfaced with earth and gravel 40 rods. Twentieth sideroad, Concessions 8 to 10, brushed out the sides of one mile of road, gravelled 175 rods and placed three culverts.

Rockville Road to Green Bay.—On Concession 10, from 15th to 20th sideroads, Bidwell, 65 rods of new road were graded and covered with gravel and one wood culvert built.

Rockville to Carnarvon.—Lots 28 and 29, Concession 2, Bidwell, 110 rods of old road covered with a good coat of gravel.

Rydal Bank Road, North.—Lot 2, Concession 2, and between Lots 2 and 3, Concession 2, Plummer, 190 rods of old road were straightened, graded and surfaced with gravel, two wood culverts.

Rainy River, Burriss Road Bridge, Repairs.—One wooden bridge, 46 ft. span was repaired on Lot 8, between Concessions 2 and 3 Burriss.

Salter Broken Front, east from Lot 5.—One mile of old road along the Spanish River was graded, 160 rods covered with gravel, 20 rods ditched, and one wood culvert

Sandford Township Roads.—Between Concessions 1 and 2, across Lots 7 and 8, and on Lots 1, 2, 3, 4, Concession 3 (main road between Oxdrift and Eagle),

3½ miles of old road were improved, 820 rods graded, ditched and surfaced with clay, 30 rods of corduroy laid and covered with clay, and a small fill; three wood culverts were placed; 345 rods of new road cleared, stumped, graded, covered with clay and gravel and ditched; six wood culverts and one 25 ft. timber bridge erected on this new road; large stumps and boulders were blasted out.

Sandfield Township Roads.—Lot 18, Concession 10, Silver Bay Road, 70 rods of old stone were graded and surfaced with gravel. Lots 26 and 27, Concession 7, 130 rods of old road covered with gravel, 25 rods graded, and one wood culvert built. Concession A, between 10th and 15th sideroad, 400 rods of old road improved by clearing 320 rods, grading 150 rods, gravelling 375 rods, and building one wood culvert. Tenth sideroad, Concessions 2 and 4, 125 rods of new road covered with gravel, 65 rods being cleared and 25 rods graded, and 100 rods of old road covered with gravel, 150 rods graded.

Schreiber to Newman's Lake.—Three-quarters mile of a new road was cleared, stumped and grubbed through a rocky country, 160 rods graded and surfaced with earth and rock, 10 rods of ditching, and five stone culverts.

Schreiber to Lake Superior.—One mile of old road improved by grading and levelling and erecting one 30 ft. pine timber bridge.

Scoble Township Roads.—Gillies and Scoble Townline, Concessions 4 to 1, two miles of old road improved by grading and surfacing with earth, 1½ miles of new road cleared, stumped and grubbed, and 3 poplar culverts placed; 160 rods re-surfaced with gravel. Road to Oliver Lake, from Lot 243 R to west of Lot R 261, ¾ mile of new road was cleared, stumped and grubbed, 28 rods of corduroy being laid and four culverts placed.

Sheddon and Victoria Townline.—North-east ¼ section 25, ½ mile of old road was graded and properly ditched, and 80 rods covered with gravel.

Silverwater to Williams'.—Lots 5 and 6, Concession 6, and Concession 8, from Lots 3 to 7, Burpee, 200 rods of old road were surfaced with gravel, and 150 rods cleared 20 ft. on each side.

Slash School, South on Townline.—Townline of Assiginac and Tehkummah, 16th Concession, 110 rods of old road were covered with gravel and one wood culvert built.

South Bay Mouth to 5th Sideroad.—Tenth sideroad, Concession 13, Tehkummah, 200 rods of old road covered with gravel and one wood culvert built.

Spanish Road, North.—Concessions 23 and 27, Sheddon, one mile of old road was graded and four small wood culverts placed.

Shakespeare, Concession 1, and Baldwin Township.—Across Lots 10, 11, 12, Shakespeare, and Lots 12 and 11, Baldwin, on Concession 1, 2½ miles of new road were opened up through ground thickly covered with pine stumps, 830 rods being cleared, stumped, grubbed and graded, 20 rods gravelled, and six wood culverts.

Stobie Road.—Lot 4, Concession 1, Aberdeen, and 40 rods in Johnson, widening a heavy sidehill to 30 ft., gravelling 40 rods and grading 80 rods.

Strange Township Roads.—Between Lots 2 and 3, across Concessions 3 and 4, 2½ miles of old road were improved by stumping 160 rods, grading and covering with clay 640 rods, and building three tamarac culverts.

Striker Township Roads.—Lots 10 and 11, between Concessions 3 and 4, one mile old road through rough and stony country was improved by gravelling 240 rods and clearing out 80 rods 20 ft. on each side.

St. Joseph Island, Concessions Q and R to A line.—Lots 4 and 5 Q and R, Jocelyn, ¾ mile of new road through very stony ground was cleared, stumped and grubbed and covered with gravel.

Tarbutt Additional, Concession 6, *Lots* 7 *and* 11.—Four hundred and forty rods of old road improved, 260 being graded and 180 rods covered with gravel.

Tehkummah Township Roads.—Tenth sideroad, between Concessions 6 and 8, 200 rods of new road were cleared, stumped and covered with gravel. Between Lots 3 and 4, Concession 6, 65 rods of new road were graded, 30 rods having to be cleared, 37 rods covered with gravel, two wood culverts and a stone fill of 25 cu. yds. Tenth sideroad, between Concessions 6 and 8, 60 rods of new road cut out, stumped and grubbed, 25 rods graded and 40 rods gravelled. Townline Assiginac and Tehkummah, north of Concession 6, 85 rods of old road graded and 65 rods covered with gravel. Lot 22, Concession 2, 50 rods of old road covered with gravel, 40 rods being graded; cut 1,000 yds. from top of a hill and filled in at the bottom along with 100 yds. of stone. Range A, Lots 24 and 25, 60 rods of new road cleared, 50 being stumped, grubbed and graded, 25 rods surfaced with earth and a fill of 100 yds. of stone. Tenth sideroad, Concession 8, 65 rods of new road cleared, 50 stumped and grubbed, 20 rods graded and 30 rods gravelled. Concessions A and B, 110 rods of new road were covered with gravel, 80 rods cleared 35 ft. and one wood culvert. Fifteenth sideroad, between Concessions 2 and 4, 75 rods of old road improved by crowning with earth, cutting two hills and filling in at bottom with earth and stone, earth cut 500 yds., stone fill 200 yds. Between 10th and 15th sideroads, Concession 2, 60 rods of old road were improved by cutting down hill and filling in at the bottom, 25 rods graded and surfaced and earth fill 250 yds., stone fill 50 yds.

Temple Township Roads.—Concession 6, Lots 1 to 2; Concession 6, Lots 9 to 10; Temple, Lot 9, Concession 6, and Lot 9, Concession 1, Mutrie; 765 rods of new road cleared, 555 rods stumped and grubbed, 179 rods graded, 170 rods covered with gravel and clay. 190 rods of corduroy laid and covered with gravel. 160 rods ditched and 11 wood culverts built, 330 rods of old road improved by stumping 30 rods, grading 65 rods, gravelling 65 rods, corduroying 90 rods and covering with gravel and building four wood culverts.

Thessalon, Sections 30 *and* 31.—One mile of new road constructed, 240 rods being cleared 66 ft., 320 rods stumped and grubbed, 240 rods graded, one metal culvert with cement ends and two wooden culverts.

Thessalon, Main Road.—East road, running south, 80 rods of road graded and covered with gravel, one wood and one concrete culvert placed.

Thessalon, between Sections 24 *and* 25.—One mile of new road opened up, 160 rods cleared, 240 rods stumped and 320 rods graded, seven cedar culverts, two hills cut and graded, and cut and fill 300 yds.

Thompson, Section 7.—Half mile of new road graded, 80 rods cleared, stumped and grubbed and two wood culverts.

Tunnel Bridge Road.—From Lot 3, Concession 4, to Lot 1, Concession 6, Wells, 2½ miles of old road graded and 40 rods being straightened, cleared, stumped and grubbed, 40 rods, graded 800 rods, surfaced with gravel 320 rods, two cedar culverts.

Umbach Township Roads.—From Lot 3, Concession 4, Mellick, to Lot 4, Concession 14, Umbach, three miles of new road cleared, stumped and grubbed, 20 rods graded and covered with gravel, 50 yds. of corduroy laid, 30 rods ditched,

six wood culverts and two 16 ft. timber bridges. This is the first work in Umbach Township.

Vankoughnet, Section 20.—Ninety rods of road through a hardwood bush were cleared, stumped and graded and one cedar culvert built.

Victoria, North Lake to Cedar Lake.—From Sections 17 and 9, angling across 17 and 8, Victoria, 1¼ miles of new road through level, green timbered land were cleared, stumped and grubbed, 80 rods ditched.

Victoria, Section 33.—One mile of old road from the Spanish-Walford Road to the Spanish River, was improved by cutting five hills and filling at the bottom, putting in eight culverts, grading one mile and covering 80 rods with gravel.

Vankoughnet, Sections 34 *and* 35.—140 rods of new road were opened up through a brule, 60 rods being cleared, 140 rods stumped, grubbed and graded and ditched by slush-scrapers.

Wabigoon Township Roads.—Lot 9, Concession 5, Lot 8, Concession 6, Lot 3, Concession 4, 4½ miles of new road were cleared, stumped and grubbed, stumping done by using dynamite, 75 rods graded, 45 rods crowned with clay, 50 rods corduroy laid and covered with clay, 175 rods ditched; eight wood culverts and one 16 ft. timber bridge erected.

Wainwright Township Roads.—Lot 1, Concession 4, Lot 5, Concession 3, Lots 4 and 5, Concession 3, Lots 4 and 7, Concession 6, 250 rods of new road through swampy land were cleared, stumped, graded and covered with gravel, 20 yards of corduroy laid and covered with gravel, 215 rods ditched and two small off-take ditches, six wood culverts, 245 rods of old road were graded and covered with gravel, 245 rods ditched with one off-take ditch, three old bridges repaired, using square timber.

Walford Village Road.—Section 27, Victoria, 30 rods of gravel placed on a soft clay road and one wood culvert built.

Waters Township Roads.—From Lots 6 and 7, Concession 4, and Lot 6, Concession 5, and Lots 5 and 6, Concession 6, 2½ miles of old road cleared and 320 rods graded, 800 rods ditching. Between Lots 4 and 5, across Concession 4, ¾ mile of old road was improved by 80 rods being covered with earth, 160 rods ditched, and one 15 ft. timber bridge erected. Between Lots 1 and 2, Concession 4, ½ mile of old road was graded and ditched on both sides. From Lots 5 and 6, Concession 3, to Lots 5 and 4, Concession 2, ½ mile of new road was cleared, stumped and ditched and two wood culverts placed.

Ware, between Lots 12 *and* 13, *Concessions* 4, 5, 6.—Two miles of new road were cleared, stumped and grubbed, 25 rods of corduroy laid and five wood culverts built.

Ware, between Concessions 4 *and* 5, *across Lots* 1 *to* 10.—Two miles of new road cleared, stumped and grubbed, across Lots 1, 2, 3, 4, 320 rods graded and covered with earth, 11 rods of corduroy laid, and eight wood culverts placed.

Ware, between Concessions 3 *and* 4, *across Lots* 11 *to* 18.—Five miles of new road were cleared, 680 rods stumped and grubbed, 20 rods corduroyed, and 15 wood culverts built.

Ware and Gorham Boundary, across Concessions 4, 5, 6.—Half mile of old road was graded and 1½ miles of new road cleared, stumped, and grubbed, 160 rods ditched, 70 rods of corduroy, four wood and one stone culverts built.

Ware and Gorham Boundary, north from the Red River Road to Concession 2 *in Ware.*—Two miles of old road were improved by grading one mile, covering one mile with gravel and surfacing one mile with earth; cleaning the ditches and constructing seven jack-pine culverts.

Wells Township, Main Road.—From Lot 12, Concession 1, to Lot 8, Concession 5, four miles of old road were improved by grading 600 rods, gravelling 300 and placing six culverts; 160 rods brushed out 32 ft.

Wells, Concession 3, *Lots* 5 *and* 8.—Half-mile of old road gravelled, 20 rods cleared, stumped and grubbed, and 30 rods graded.

West Bay, Concessions 10 *and* 12.—Kagawong to West Bay, Lakeshore Road, between Concessions 10 and 12, Billings, 50 rods of old road improved by grading and levelling.

White's Road, Aberdeen.—Lots 11 and 12, Concession 4, Aberdeen, ½ mile of old road graded and surfaced with gravel.

Zealand Township Roads.—Concession 6, Lots 14 to 18, Concession 3, Lots 5 and 6, 2½ miles of new road opened up to connect Hartman Township Road with Wabigoon, 720 rods cleared, 500 rods stumped, 85 rods graded and covered with gravel, 85 rods ditched, 300 yds. of corduroy laid and covered with gravel and clay; eight wood culverts and one 30 ft. timber bridge built. The old road improved was 775 rods, 650 rods being stumped, grubbed, graded and crowned with earth; 220 rods of corduroy were covered with clay, four off-take ditches dug, two wood culverts and one 20 ft. wood bridge erected.

NORTH DIVISION.

By-laws.

Alberton By-law No. C.—Road No. 2. Beginning at the north-east corner of Section 16, Crozier, and running south 4 miles to river, 480 rods of old road were repaired, 240 rods being graded 22 ft., 2 wood culverts placed and 240 rods of new ditch. Road No. 4. Boundary between Townships of McIrvine and Crozier across Lot 1 and in south-west direction to Indian Reserve. 225 rods of old road were covered with gravel. Road No. 5. Beginning at south-east corner Section 29, Crozier, and running north to Miscampbell townline. Two miles of old road were repaired, 636 rods being covered with gravel.

Assiginac By-law No. 360.—Road No. 1. The New England and Slash Road between Concessions 1 and 2 from Lots 1 to 13, 450 rods of new road were graded, 325 rods covered with gravel and 1 wood culvert. Road No. 2 Manitowaning and Squirreltown Road across Concessions 1 and 2, 600 rods were covered with gravel and 150 rods graded. Road No. 3. Clover Valley Road, 150 rods cleared, 80 rods graded, 200 rods gravelled, fill 50 yards of earth and 1 wood culvert built. Road No. 4. From Manitowaning west to Tehman's Corners, 600 rods gravelled, earth and stone fill 100 yards, 4 wood culverts. Road No. 5. From Tehman's Corners north-west to Norquay's Corner. Sucker Lake Road and Ten Mile Point Road, 365 rods of new road were cleared 45 ft. wide, 75 rods graded, 300 rods covered with gravel, 4 wood culverts placed and one 16 ft. timber bridge repaired. Road No. 6. From Norquay's Corner north-west to limit of Municipality, 550 rods gravelled, 2 wood culverts repaired.

Balfour By-law No. 36.—Road No. 1. Between Concessions 4 and 5, across Lots 4 to 7, 2 miles of old road were graded, 4 wood culverts placed and 900 rods ditched. Road No. 2. Across centre of Lot 2, Concession 1, one mile of old road graded and ditched, 10 rods of it being cleared, stumped and grubbed 40 ft. and two wood culverts placed. Road No. 4. Rayside and Balfour boundary

across Concessions 3 and 2. One mile old rod graded, 640 rods of ditching and 3 wood culverts. Road No. 5. Between Concessions 3 and 4 across Lots 5 to 8. One mile of old road was cleared 40 ft., graded 22 ft., and ditched on both sides, 7 wood culverts placed and two 18 ft. timber bridges erected.

Billings By-law No. 216.—Road No. 1. On the line between Concessions 6 and 7, across Lots 1 to 5, 65 rods old road covered with gravel. Road No. 2. From the 8th Concession south on Kagawong and Providence Bay Road to Billings and Carnarvon townline. 110 rods of old road graded, 85 rods covered with gravel and 1 wood culvert placed. Road No. 3. 8th Concession from Indian River west to townline of Billings and Allan, 120 rods graded, 150 rods gravelled, fill 10 yards stone, 15 yards of earth, 1 timber bridge repaired. Road No. 4. From the 8th Concession on the 20th sideroad to the 14th Concession. 500 rods covered with gravel. Road No. 5. Townline of Billings and Allan north from Concession 8 to Concession 14, 140 rods of old road gravelled, rock cut 2 yards and 2 stone culverts. Road No. 6. Concession 12 from Kagawong Lake east to 20th sideroad, 110 rods of old road covered with gravel, fill 5 yards of stone and 1 wood culvert placed. Road No. 7. From the 15th sideroad along the 14th Concession to Love's Corner and North Hill at Kagawong Village, 230 rods of old road surfaced with gravel, fill 20 yards of earth and 1 wood culvert. Road No. 8. From Snowston north to Billings and Allan townline, 125 rods of new road graded, 10 rods gravelled and 1 wood culvert built. Road No. 9. From bridge, east to Concession 16, Lot 24, 65 rods of old road gravelled and 1 wood culvert repaired. Road No. 10. From Concession 16 south on the 25th sideroad to Concession 4, 75 rods of old road were graded, 25 rods gravelled and 1 wood culvert.

Blezard By-law No. 68.—Road No. 1. In front of Concession 5, from Lots 7 to 12, 2 miles of new road graded and ditched on both sides. Road No. 2. In front of Concession 6, between the east boundary line to Lot 7, 3 miles of old road were graded and ditched on both sides.

Blue By-law No. 12.—Road No. 1. Between Sections 35 and 26, 76 rods of old road graded, 66 rods ditched and 1 wood culvert. Road No. 2. Between Sections 14 and 23, 60 rods of new road cleared, stumped, grubbed and graded. Road No. 3. Between Sections 11 and 14, 58 rods of new road cleared, stumped and graded. Road No. 4. Between Sections 2 and 11, 1 mile of new road cleared, stumped and grubbed. Road No. 5. Between Sections 3 and 10, 120 rods of new road cleared, stumped and graded. Road No. 6. Between Sections 9 and 15, 100 rods of new road cleared, stumped and graded and 2 wood culverts built. Road No. 7. Between Sections 8 and 17, 200 rods of new road cleared, stumped and grubbed and 25 rods corduroyed. Road No. 8. Between Sections 16 and 17, 70 rods of new road cleared, stumped, grubbed and corduroyed. Road No. 9 Between Sections 20 and 21, 75 rods of new road cleared, stumped and graded. Road No. 10. Between Sections 21 and 22, 30 rods of new road gravelled, 20 rods being cleared, stumped and grubbed 66 ft. wide. Road No. 11. Between Sections 15 and 22, 60 rods of old road graded 28 ft. wide.

Carnarvon By-law No. 282.—Road No. 1. In front of Lots 20, 25, and 28, Concession 4, 150 rods old road graded, 275 rods covered with gravel and 2 wood culverts. Road No. 2. Concession 4, in front of Lots 15 and 16, in front of Lots 18 and 19 on Lakeshore, in front of Lot 13, Concession 6, on the 15th sideroad south and north of Concession 6, 225 rods of old road graded, 275 rods

gravelled, 30 rods ditched, 1 culvert repaired and 2 cement culverts placed. Road No. 3. On Concession 6 in front of Lot 2 and east of the 5th sideroad and on 5th sideroad north Concession 2, 225 rods were crowned with gravel, a fill of 200 loads of stone, 75 loads of earth and one 16 ft. timber bridge built. Road No. 4. On the 5th sideroad north from Concession 10, and the road through Lot 1 from Concession 10 south and the road to the dock from the town, 260 rods of old road gravelled, fill 8 yds. of stone, 10 yds. earth, 1 wood culvert built. Road No. 5. On Concession 12, in front of Lots 3 and 4 and south from Concession 12 on 10th sideroad, 225 rods of old road covered with stone and gravel, 125 rods graded, fill 75 yds. stone, 50 yds. earth and 1 wood culvert. Road No. 6. Lakeshore Road in front of Lot 23, 270 rods of old road improved, 200 being graded and 270 rods gravelled. Road No. 7. Lot 4, Concession 8, and bridge on 5th Concession north of Concession 8, 150 rods graded and gravelled, 2 stone culverts placed, and at bridge fill of 210 yds. of stone and 210 yds. of earth.

Chapple By-law No. 172.—Tait and Shenstone townline, 612 rods old road graded, 93 rods ditched, fill 114 yds. of earth, 1 wood culvert. Road No. 2. Between Sections 3 and 4, Tait, 119 rods of old road graded, 110 rods being cleared, and 20 rods ditched. Road No. 3. Tait Road between Sections 4 and 5, 8 and 9, 9 and 16, 16 and 15, 15 and 22, 22 and 23, 26 and 27 and 34 and 35, 2 miles of this old road were graded and two wood culverts built. Road No. 4. Tait, west townline, 130 rods of road cleared 66 ft. wide. Road No. 5. Between Sections 26 and 35, 25 and 36 Tait, 140 rods old road graded, 48 rods ditched. Road No. 6. Between Sections 22 and 23 and 26 and 27, Shenstone, 1 mile of old road graded, 240 rods being cleared 20 ft. on each side and 34 rods ditched. Road No. 7. Between Sections 19 and 30, 20 and 29, 21 and 28, 22 and 27, Shenstone, 160 rods of old road improved, 70 rods cleared 33 ft. wide, 160 rods graded 28 ft. wide and 25 rods gravelled. Road No. 8. Between Sections 26 and 35, 35 and 26, Shenstone, 160 rods of old road improved, 90 rods graded, 70 rods ditched. Road No. 9. Between Sections 14 and 23, Shenstone, 80 rods of old road graded, earth fill of 100 yds. Road No. 10. Between Sections 12 and 13, 11 and 14, Shenstone, 240 rods of old road cleared, 72 rods ditched and 2 wood culverts. Road No. 11. Mather-Dobie townline, 353 rods of old road improved, cleared 279 rods, graded 353 rods, gravelled 51 rods, ditched 39 rods, corduroy, 10 rods, fill 18 yds. earth, 13 wood culverts. Road No. 12. Between Lots 6 and 7 north from Concession 3, Mather, 109 rods of old road graded, 17 rods corduroyed and 3 wood culverts built. Road No. 13. Between Concessions 2 and 3 across Lots 7 and 8, Mather, 222 rods of old road graded, 57 rods brushed and a fill of 85 yds. earth. Road No. 14. Between Concessions 1 and 2 across Lots 2 and 3, Mather, 125 rods of old road graded, 20 rods ditched, 2 wood culverts built. Road No. 15. Between Lots 8 and 9, Concession 6, Mather, 98 rods of old road graded, 10 rods ditched and 2 wood culverts built. Road No. 16. Between Lots 8 and 9, Concession 5, 165 rods of new road cleared, stumped and grubbed. Road No. 17. Between Concessions 4 and 5 near west of Mather, 110 rods of old road graded, 30 rods ditched and 1 wood culvert. Road No. 18. Across Lots 6 and 7, Concession 1, Mather, 88 rods of old road graded and earth fill of 16 yds. Road No. 19. Between Lots 8 and 9, Concession 1, Mather, 100 rods of old road graded and 65 rods ditched. Road No. 20. Between Lots 6 and 7, Concession 5, Dobie, 106 rods of old road improved, 10 rods graded, 16 rods surfaced with earth, 52 rods ditched and 86 rods

corduroyed. Road No. 21. Between Concessions 2 and 3, Dobie east end, 78 rods of old road graded, 44 rods of corduroy covered with earth. Road No. 22. Between Concessions 4 and 5, Dobie east end, 159 rods of old road graded, 86 rods ditched, 7 rods corduroyed and 2 wood culverts. Road No. 23. Between Concessions 5 and 6 Dobie east end, 173 rods of old road stumped, grubbed and corduroyed. Road No. 24. Between Concessions 4 and 5 Dobie, west end, 373 rods of old road graded, 30 rods brushed and ditched and 1 wood culvert. Road No. 25. Between Lots 10 and 11, Con. 2, Dobie, 79 rods of old road graded, 20 rods ditched and 1 wood culvert. Road No. 26. Between Concessions 1 and 2 west end, Dobie, 42 rods of old road covered with gravel. Road No. 27. Between Concessions 3 and 4, Dobie west end, 126 rods of old road graded, 37 rods brushed, 51 yds. crowned with earth, 26 rods ditched. Road No. 28. Barwick Village Road, 120 rods of old road improved, 60 rods being graded, 60 rods surfaced with gravel and 2 wood culverts placed. Road No. 29. Rosebury-Shenstone townline, 66 rods of old road stumped, grubbed and graded. Road No. 30. Between Lots 40 and 41, Barwick, 58 rods of old road graded, 20 rods ditched and a fill of 95 yds. Road No. 31. Between Lots 8 and 9, Barwick, 66 rods of new road cleared, stumped and grubbed.

Conmee By-law No. 13.—Road No. 1. On the townline between Conmee and O'Connor, ¼ mile of old road was resurfaced with 6 in. of earth and 3 cedar culverts constructed. Road No. 2. From Wokoman Station west between Concessions 6 and 7, ¼ mile of new road cleared and ¼ mile of old road graded, surfaced with earth and ditched. Road No. 3. Through Concession 1, across Lots 1 to 7, ¼ mile of old road graded and surfaced with earth and 3 cedar culverts built. Road No. 4. Between Lots 6 and 7 across Concessions 1 to 3, ¼ mile of old road was resurfaced with earth and 3 cedar culverts placed. Road No. 5. Between Lots 4 and 5, across Concessions 1, 2, 3, ¼ mile of old road was graded and surfaced with earth. Road No. 6. Between Lots 2 and 3 across parts of Concessions 1 and 2, 80 rods of new road were cleared, stumped and grubbed. Road No. 7. Across Concessions 1, 2, 3, between Lots A and 1, 80 rods of old road were graded, surfaced with earth and ditched and 2 spruce culverts built. Road No. 8. Between Concessions 2 and 3 from Lot 1 to Hume Siding, a hill 40 rods in length was graded, surfaced with earth and ditched. Road No. 9. Between Concessions 1 and 2 from Lot 1 east, 80 rods of new road were cleared 40 ft. wide. Road No. 10. Between Lots B and C, across Concession 4, 20 rods of old corduroy were covered to a depth of 6 inches with earth.

Cockburn Island By-law No. 86.—Road No. 1. Between Concessions 11 and 12, from Lots 24 to 30, 100 rods of old road were graded, 70 rods surfaced with earth, 26 rods ditched and two wood culverts placed. Road No. 2. Between Lots 15 and 16 across Concession 9, 100 rods of old road graded and 75 rods of it covered with gravel. Road No. 3. Between Lots 10 and 11, across Concessions 8 and 9, 50 rods of new road were cleared 35 ft. wide and graded 22 ft. wide through a very stony ground.

Day and Bright Additional By-law No. 4.—Road No. 1. Between Concessions 2 and 3 on the Daton Road from Day Mills to Spring Creek, 30 rods of old road surfaced with gravel and a fill of 190 yds. of earth.

Dilke By-law No. 57.—Road No. 1. Colonization Road east of Pinewood, 58 rods ditched and 1 iron culvert placed. Road No. 2. Between Sections 34 and 35, north from the Colonization Road, 250 rods of old road graded and 3 iron culverts

placed. Road No. 3. Between Sections 38 and 34 north to the Colonization Road, 84 rods old road graded and ditched, 25 rods corduroyed and 1 iron culvert. Road No. 4. On the townline between Dilke and Nelles, 190 rods of new road cleared, stumped and graded, 13 rods corduroyed. Road No. 5. Between Sections 36 and 25, 1 mile stumped and grubbed, 360 rods of ditches, 3 iron culverts placed. Road No. 6. Between Sections 31 and 32, 155 rods of old road improved, 80 rods cleared 30 ft., 75 rods surfaced with gravel and 2 iron culverts placed. Road No. 7. Townline of Dilke and Worthington north from Colonization Road, 78 rods old road graded. Road No. 8. Between Section 32 and River Lots, 60 rods of old road graded. No. 9. Between Sections 35 and 36, 170 rods of old road ditched. No. 10. Dilke and Morley townline east of Section 36, 15 rods graded, 35 rods ditched and 1 wood culvert.

Emo By-law No. 171.—Road No. 1. Commencing opposite Lot 40 R. R. Aylsworth and running south, 376 rods of old road graded, 215 rods gravelled and 156 rods cleared along sides. Road No. 2. Between Lots 8 and 9, R. R. 80 rods graded, 25 rods gravelled and 2 wood culverts. Road No. 3. East from the north-west corner of Section 3, 380 rods surfaced with gravel, 1 ditch 30 rods long. Road No. 4. South on the Government Road from Lot 32 River Range Slash, 300 rods covered with gravel, 160 rods graded. Road No. 5. Between Sections 11 and 14 Lash, 66 rods of old road improved, 60 rods graded, 30 surfaced with earth and two wood culverts built. Road No. 6. Between Sections 15 and 22 Lash, 160 rods graded 30 ft. Road No. 7. East from Walker St. Emo, 240 rods of road covered with gravel. Road No. 8. Near bridge Section 32 Lash, 225 rods covered with gravel, a new 64 ft. timber bridge erected, requiring a fill of 1,500 yds. No. 9. Between Sections 25 and 26 Lash, brushed out new road. No. 10. Section 23, Lash, east from the north-east corner, 175 rods of old road ditched and 1 wood culvert built. Road No. 11. Townline Carpenter and Lash east from Lot 5, 320 rods of old road graded, 60 rods cleared, 32 rods corduroyed, 3 wood culverts. No. 12. East from Lot 6, Concession 1, Carpenter, 130 rods of old road cleared 20 ft. on each side, 110 rods being graded and 20 rods surfaced with earth and 160 rods ditched. No. 13. East from Lot 6, Concession 3, Carpenter, 352 rods of old road ditched and 35 rods corduroyed. Road No. 14. Concession 4, Carpenter, 260 rods covered with gravel. No. 15. Between Lots 2 and 3, across Concessions 2 and 3, 480 rods cleared 66 ft. and 83 rods graded. Road No. 16. From the north-west corner of Section 32 Lash, easterly, 720 rods graded, 35 rods gravelled and a fill of 151 yds. earth. No. 17. Between Lots 10 and 11, north from the townline Lash and Carpenter, 320 rods old road graded, 84 rods of gravel and 204 rods cleared 33 feet. Road No. 18. Between Lots 9 and 10 north from the townline Lash and Carpenter, 100 rods graded, 84 rods surfaced with gravel and 90 rods ditched. Road No. 19. Concession 2, east from Lot 8 Carpenter, 124 rods of old road cleared and 44 graded, and 80 rods gravelled. Road No. 20. Commencing at the townline of Dobie and Carpenter, east on Concession 3, 200 rods graded, 40 rods cleared and 30 rods ditched. No. 21. Bridge on Concession 1, opposite Lot 11, a new timber bridge having a span of 12 ft. was erected.

Gordon By-law No. 125.—Road No. 1. Between Concessions 8 and 9, from Lots 13 to 30, 240 rods covered with gravel, 170 rods graded and 1 culvert repaired. Road No. 2. Concessions 6 and 4, Lots 12 to 22. 340 rods old road covered with gravel and 2 culverts repaired. Road No. 3. Along the Government Road

from Lots 1 to 15, 365 rods old road gravelled, 25 rods graded, earth fill 20 yds., and 2 wooden culverts repaired. Road No. 4. Vattres Road, 1¼ miles surfaced with gravel, 170 rods graded. Road No. 5. Scotland Road, ¾ mile of new road was graded, 200 rods surfaced with gravel and two stone culverts built. No. 6. Ice Lake Road, 500 rods of old road covered with gravel, 2 wood and 1 stone culverts placed. Road No. 7. Roads in front of Concessions 11 and 12, 125 rods of new road covered with gravel, 20 rods graded, 10 yds. rock, 15 yds. earth fill, and 1 wood culvert placed.

Hilton By-law No. 357.—Road No. 1. On the line between Sections 16 and 17, from Lot A to Lot 7, and from Lots 15 to 21, Concession N, 3 miles of general repairs and gravelling, fill 300 yds. earth, and 3 wood culverts built. Road No. 2. From Lots 6 to 18, Concession 13, clearing stone and brush on 380 rods of old road, grading 180 rods, surfacing with gravel, 190 rods. Road No. 3. From Lots 15 to 24, Concession B, ¼ mile of old road crowned with gravel and 30 rods cleared 10 ft. on each side. Road No. 4. From Lot 16 to Lot 19 and on Lot 24 Concession U, 65 rods old road gravelled, 60 rods sidebrushed, 3 wood culverts and one 12 ft. wooden bridge built. Road No. 5. From Lots 2 to 4 and on Lot 16, Concession W, 60 rods sidebrushed, 90 rods graded and 50 rods gravelled. Road No. 6. From Lot 7 to Lot 9, Concession X, 14 rods of old road cleared, stumped and graded, and 20 rods gravelled. Road No. 7. Townplot of Hilton and Marksville, 160 rods gravelled, 48 rods cleared, stumped and grubbed.

Howland By-law No. 86.—Road No. 1. Howland and Sheguiandah Main Road from Schoolhouse to Indian Reserve, 210 rods covered with gravel, and 2 wood culverts placed. Road No. 2. Concession 10, Lots 15 and 16 Sheguiandah, 170 rods gravelled, 12 rods graded and 1 wood culvert built. Road No. 3. Lot 12, Concession 12, Bidwell, 100 rods gravelled and 1 wood culvert repaired. Road No. 4, Howland and Bidwell townline, easterly to Lot 10, 150 rods gravelled, 100 yds. stone fill, 125 yds. earth fill. Road No. 5. Hill on Indian Reserve Concession 12, Sheguiandah, hill cut down and filled at bottom, cut 150 yds. rock, 500 yds. earth, graded 25 rods and gravelled 30 rods. Road No. 6. From the 15th sideroad east along 4th Concession, 400 rods of new road graded, 40 rods covered with gravel and 2 wood culverts constructed. Road No. 7. McLean's Mountain between Lots 5 and 6, Concession 7, Howland, 40 rods graded, 74 rods gravelled, and 1 wood culvert. Road No. 8. From Lot 1, Howland westward along the 6th Concession, 75 rods old road crowned with stone and 1 wooden culvert repaired. Road No. 9. Between Lots 5 and 6, Howland, south from the 4th Concession, 150 rods gravelled, 25 yds. earth, 5 yds. stone fill and 1 wood culvert placed. Road No. 10. Between Lots 15 and 16, south from the 10th Concession Bidwell, 35 rods covered with earth and gravel.

Jaffray and Mellick By-law No. 53.—Road No. 1. Concessions 3 and 5, Lots 5 to 20. 1 mile of old road improved, ½ mile being stumped and grubbed, 1 mile graded, ¾ mile covered with clay and gravel, 2 wood culverts and two small off-take ditches. Road No. 2. From Lot A 18 to Lot 386 P in Concession 4, 2½ miles of road graded, 2 miles gravelled, 4 wood culverts, 2 small off-take ditches. Road No. 3. From Lot 352 to Lot 14, between Concessions 4 and 5, ½ mile of old road cleared, stumped, graded, 80 rods surfaced with gravel and clay, 2 wooden culverts and 3 short off-take ditches. Road No. 4. From Concession 6, Lot 9, Jaffray north-east to Lot 1, Concession 2, Mellick, 1½ miles of old road were cleared 10 ft. on each side, 320 rods stumped, 160 rods

graded, 160 rods gravelled, 3 wood culverts and one 20 ft. timber bridge built. Road No. 5. From Concession 7, Lot 9, Jaffray, to Lot 3, Concession 3, Mellick, 1 mile of old road cleared, 260 rods stumped, 160 rods graded, 80 rods gravelled and 2 wood culverts. Road No. 6. From Concession 6, Lot 5, to Concession 8, Lot 7, ½ mile of old road was improved by grading and gravelling, 6 rods of corduroy covered with clay and two wood culverts. Road No. 7. From Concession 6, Lot 21, Jaffray, to Concession 4, Lot 12, Mellick, 1½ miles of old road cleared, 160 rods stumped, 160 rods graded, 240 rods crowned with gravel and clay and 1 wood culvert. Road No. 8. Lots 1, 2, 3, Concession 7, Jaffray, ½ mile of old road stumped and graded, and 80 rods gravelled. Road No. 9. From Concession 2, Lot 13 to Concession 3, Lot 10, Mellick, ½ mile of old road sidebrushed, 80 rods stumped and graded, 40 rods gravelled, 10 rods corduroyed and covered with clay and 1 wood culvert placed. Road No. 10. From Concession 2, Lot 13, to Concession 3, Lot 15, Mellick, ½ mile of old road stumped and grubbed, 80 rods graded, 80 rods gravelled, 2 small off-take ditches and 1 wood culvert. Road No. 11. From Concession 7, Lot 3, to Concession 8, Lot 1, Jaffray, ½ mile of old road sidebrushed, 100 rods graded, 100 rods surfaced with clay, 2 short off-take ditches and 2 wood culverts.

Jocelyn By-law No. 268.—Road No. 1. Huron and Neebish Road, ½ mile graded and ditched and 2 wood culverts repaired. Road No. 5. From Lot 1 to Lot 5, Concessions O and P, 200 rods graded and 80 rods gravelled. Road No. 6. From Concession S and T, to Concession U, between Lots 5 and 6, ½ mile of old road improved by removing stone and gravelling 80 rods. Road No. 7. From Lot 10 to Lot 13, Hilton Road, brushing and gravelling 80 rods. Road No. 8. On the U line from the 10th line to the boundary line, underbrushing the sides and gravelling half mile of old road. Road No. 9. From Concession K to Hilton Road on Concession A, and from Huron Concession to Lot 3, Hilton Road, Concession M, 1 mile of old road improved, brushing 80 rods, grading 300 rods, gravelling 80 rods, 1 stone and 1 wood culvert, and repairing 1 wooden bridge.

*Johnston By-law A*44.—Road No. 1. On the line in front of Concession 5, from Lots 3 to 4, 201 rods old road covered with gravel. Road No. 12. Hinck's Survey, Concession 5, in front of Lots 5, 6, 7, 8, 14 rods of old road graded, 160 rods crowned with gravel. Road No. 3. Kensington Point Road, from Lot 44, Desbarats Survey, Johnson, to C. P. R. track, 120 rods of old road covered with gravel. Road No. 4. Gordon Lake Road crossing Lot 3, Concession 4, Johnson, 77 rods of old road covered with gravel.

Korah By-law No. 118.—Road No. 1. People's Road from the 3rd line north to the northern boundary of Municipality and Korah Road from the 2nd base line to the north boundary of Municipality, 160 rods of old road brushed 10 ft. on each side, 160 rods stumped and grubbed, 3,761 rods graded, 960 rods gravelled, 150 rods ditched, 10 rods corduroyed, 189 yds. earth cut, 14 yds. rock cut, 1 cedar and 1 iron culvert, three 16 ft. wooden bridges built and 1 old cedar bridge repaired, new road 40 rods cleared, stumped and grubbed, 160 rods graded, total road improved, 17½ miles. Road No. 2. North Korah Road from the 3rd line, Concession 21 to north boundary and the 3rd line from centre of Section 22 to the west boundary, old road improved 7½ miles, sidebrushed 230 rods, graded 480 rods, gravelled 640 rods, hill cut 500 yds. and 142 yds., earth fill 163 yds., clay fill 50 yds., 1 iron culvert and one 10 ft. timber bridge. Road No. 3. Base line No. 2, from centre of Section 35 to west boundary, 6 miles of old road im-

proved by distributing 476 cu. yds. gravel, making an earth fill 426 cu. yds. and building two 16 ft. timber bridges. Road No. 4. Base line from Spring Creek centre of Section 34 to Moore Sideroad and base line from Section 33 westerly, to Section 3, 8 miles of old road were improved, 380 rods brushed, 970 rods graded, 1,182 yds. of gravel spread, 160 rods of ditch widened, clay fill 125 yds., earth fill 97 yds., 3 iron and 2 wood culverts, 1 new 12 ft. timber bridge, 2 old bridges recovered with tamarac.

Laird By-law No. 99.—Road No. 1. On the line between Sections H & K from Lakeshore to Trunk Road, 2 miles of old road graded and 80 rods surfaced with gravel. Road No. 2. Across Sections 27 and 28, two miles of old road graded. Road No. 3. In a southerly direction from townline of Laird and McDonald between Sections 4 and 5, 1 mile of old road graded and 160 rods surfaced with gravel.

Lavallee By-law No. 125.—Road No. 1. East from Lot 48 on the townline of Woodyatt, 110 rods old road graded and 15 rods covered with gravel. Road No. 2. Between Lots 35 and 36 Woodyatt, 53 rods of old road gravelled. Road No. 3. Between north-east corner Section 32 and north-west corner Section 33 Woodyatt, 88 rods of old road gravelled. Road No. 4. Between Lots 40 and 41 Woodyatt, 2 rods of old road cleared 66 ft. wide, and 1 wood culvert built. Road No. 5. Between Sections 24 and 25 Woodyatt, 20 rods of old road stumped and grubbed, 160 rods graded, 40 rods ditched. Road No. 6. Between Lots 32 and 33 south on Devlin Road, 80 rods covered with gravel. Road No. 7. East from Section 33, 80 rods old road graded and 1 wood culvert built. Road No. 8. West from Lot 25 Woodyatt, 49 rods surfaced with gravel. Road No. 9. Between Section 32 Devlin, and Lots 9 and 10 Burriss, 120 rods of old road graded. Road No. 10. Between Sections 32 and 33 Devlin, 80 rods graded and 1 wood culvert built. Road No. 12. Between Sections 20 and 21 south of the C. N. R. and between Sections 16 and 17 Devlin, 115 rods of old road improved by being covered with gravel, 50 rods graded, 1 wood culvert built. Road No. 13. Between Sections 21 and 16 Devlin, 107 rods old road graded, 114 rods corduroyed. Road No. 14. Between Sections 17 and 8, 110 rods old road stumped and grubbed, 40 rods graded, 58 rods ditched. Road No. 15. Between Sections 8 and 9 Devlin, 75 rods old road surfaced with gravel and 1 wood culvert built. Road No. 16. Between Sections 6 and 7, 108 rods old road cleared and graded, 56 rods surfaced with earth. Road No. 17. Between Sections 9 and 4, 100 rods old road improved, 40 rods being covered with gravel and 60 rods ditched, fill 30 yds. earth. Road No. 18. Between Section 36 and Lot 2, Concession 1 Burriss, 130 rods old road ditched and 1 large culvert built. Road No. 19. Between Sections 35 and 36, 300 rods old road repaired, 175 rods graded, 175 rods gravelled and 1 wood culvert built. Road No. 20. Between Sections 27 and 26, 1 mile of old road regraded and 2 wood culverts. Road No. 21. Between Sections 22 and 23 north of the C. N. R., Devlin, 80 rods graded, 50 rods gravelled and 3 new wooden culverts built. Road No. 22. Between Sections 22 and 14 Devlin, 194 rods of old road improved, graded 34 rods, ditched 160 rods and 2 wood culverts placed. Road No. 23. Between Sections 15 and 10 Devlin, 95 rods of old road cleared, stumped and grubbed and 2 wood culverts built. Road No. 24. Between Sections 10 and 3 Devlin, 40 rods gravelled and 1 wood culvert. Road No. 25. Between Sections 31 and 32 Devlin, 37 rods stumped, grubbed and corduroyed. Road No. 26. Boundary between Section 31 Devlin, and Lots 11 and 12 Burriss, 106 rods graded,

30 rods ditched and 1 wood culvert. Road No. 27. Between Lots 4 and 5, Concession 1, Burriss, 1 mile old road ditched and 120 rods surfaced with earth. No. 28. Between Lots 4 and 5, Concession 2, Burriss, 120 rods covered with gravel. Road No. 29. Between Lots 4 and 5, Concession 3, Burriss, 140 rods gravel. Road No. 30. Between Lots 4 and 5, Concession 4, Burriss, 85 rods old road improved, 35 rods being ditched and 20 rods covered with gravel and fill 30 yds. earth. Road No. 31. Between Lots 8 and 9, Concession 3, Burriss, 300 rods old road graded and 1 wood culvert built. Road No. 32. Between Lots 8 and 9, Concession 4, Burriss, 125 rods old road graded and 1 wood culvert. Road No. 33. Between Lots 8 and 9, Concession 5, Burriss, 200 rods old road graded and 47 rods ditched. Road No. 34. Between Lots 10 and 11, Concession 3, Burriss, 9 rods old road stumped, grubbed and graded and 15 rods ditched. Road No. 35. Between Concessions 3 and 4, across Lots 5 and 6, Burriss, 280 rods old road stumped, grubbed and ditched. Road No. 36. Between Concessions 2 and 3, across Lots 7 and 8, Burriss, 100 rods old road improved, 60 rods graded, 20 rods corduroyed, 636 yds. fill and 1 wood culvert. Road No. 37. Between Concessions 2 and 3, Lots 9 and 10, Burriss, 250 rods old road graded. Road No. 38. Between Concessions 4 and 5, across Lots 5 and 6, Burriss, 116 rods old road improved, 160 rods graded and 106 rods ditched. Road No. 40. Between Concessions 5 and 6, across Lots 7 and 8, Burriss, 240 rods old road cleared, 45 rods stumped and grubbed.

Morley and Pattullo By-law No. 116.—Road No. 1, across R. R. Lots 16 to 7, Morley, ½ mile of old road improved, 80 rods graded, fill 130 yds. earth and one 18 ft. iron culvert. Road No. 2, across R. R. Lots 17 and 18, Morley, 30 rods of old road improved by 80 rods ditching and building one wood culvert. Road No. 3, R. R. Lots 16 and 17, Morley, one mile of old road surfaced with gravel. Road No. 4, between Sections 10 and 15, Morley, 300 rods old road covered with gravel, 80 rods sidebrushed. Road No. 5, between Sections 14 and 15, Morley, 105 rods old road crowned with gravel and one 62 ft. timber bridge built. Road No. 6, between Sections 14 and 23, Morley, 200 rods old road cleared and graded. Road No. 7, between Sections 15 and 22, Morley, 230 rods new road cleared, stumped and graded 30 ft. wide. Road No. 8, between Sections 23 and 26, Morley East, 1½ miles surfaced with gravel. Road No. 9, between Sections 25 and 36, Morley, 134 rods gravelled, six rods ditched and one wood culvert placed. Road No. 11, between Sections 28 and 13, Morley, 160 rods new road, cleared, stumped and grubbed. Road No. 12, Morley and Pattullo townline, 560 rods sidebrushed, 420 rods graded, 70 rods ditched, 250 yds. earth fill, and two iron culverts. Road No. 13, Section 17, Morley, 240 rods new road cleared, stumped and grubbed. Road No. 14, between Sections 35 and 36, Pattullo, 50 rods new road cleared, stumped and graded. Road No. 15, between Sections 31 and 32, Morley, 20 rods new road cleared, stumped and grubbed, one 52 ft. wood bridge and fill 220 yds. earth. Road No. 16, between Sections 11 and 12, Morley, 80 rods sidebrushed, 40 rods graded, one wood culvert and fill of 150 yds. of earth. Road No. 17, between Sections 1 and 2, Pattullo, 100 rods old road ditched, 30 rods corduroyed and crowned with earth. Road No. 18, between Sections 4 and 5 and 8 and 9, Pattullo, 100 rods of new road cleared and graded. Road No. 19, between Sections 5 and 6 and 7 and 8, Pattullo, 200 rods old road graded, 120 rods brushed out on each side and two wood culverts. Road No. 20, Nelles and Pattullo townline, one 25 ft. and one 50 ft. wood bridge and fill of 150 yds. Road No. 21, between Sections 6 and 7 and 5 and 8, Pattullo, 60 rods

old road cleared and graded, and 60 rods new road cleared, stumped, and graded. Road No. 22, between Sections 16 and 17, Pattulo, 200 rods old road sidebrushed, 160 rods graded, and two wood culverts built, also 40 rods of new road cleared, stumped and grubbed.

McDonald, Meredith and Aberdeen Additional, By-law No. 115.—Road No. 1, on Concession 2, across Lots 5 and 6, and south between Lots 4 and 5, in Aberdeen. Additional, 200 rods old road graded and covered with gravel. No. 2, from Concession 2, Aberdeen. Additional, through Lots 6 and 5, Concession 2, and then to Concession 3, between Lots 2 and 3, Concession 4, ¾ mile of old road ditched, 60 rods covered with gravel, cut and fill 270 yds., and one wood culvert. Road No. 3, between Sections 29 and 30 Meredith, ½ mile of old road improved, 40 rods graded, 140 rods gravelled. Road No. 4, South, along the boundary between McDonald and Meredith, alongside Section 25, ten rods of ditch cribbed with stone on each side, rock fill 110 yds. Road No. 5, Sylvan Valley, through Sections 26 and 23, 60 rods old road crowned with gravel and 30 rods ditched. Road No. 6, Echo River Road, through Sections 3 and 9, 120 rods surfaced with gravel and one iron culvert placed. Road No. 7, from the foot of Hurley's Hill, west through Section 29, 120 rods old road covered with gravel. Road No. 8 east, along Sections 19, 20, 21, to Stewart's, 120 rods gravelled and one metal culvert placed. Road No. 9, Crocker Road "bog" along Sections 24, 26 and 36, ½ mile of old road improved, 40 rods being cleared, 100 rods graded, 80 rods gravelled and 190 rods ditched. Road No. 10, between Sections 29 and 32 McDonald, 80 rods gravelled, 40 rods graded and one culvert placed.

McKim By-law No. 133.—Road No. 1, Sudbury-Rayside road, four miles old road graded. Road No. 2, Coppercliffe and Broder Road, five miles of old road graded 24 ft. wide. Road No. 3, Wahnapitae Road to Sudbury, two miles old road graded. Road No. 4, Stobie Road, in Concession 5, six miles old road graded.

Neebing By-law No. 237.—Road No. 1, 20th sideline of Neebing, between the Roslyn Road and Arthur Street, north of the Kaministiquia River, 1½ mile of old road surfaced with earth, two hills 200 ft. long cut down 6 ft., removed 300 yds. earth, and raised one bridge, driving four piles in each abutment, filled in three ravines 2,400 yds. and constructing 600 rods of ditch. Road No. 2, Neebing, 15th sideline, from Arthur Street to the Kaministiquia River, thence south on line between Concessions 2 and 3, 1,360 rods old road cleared, stumped, graded and surfaced with earth and gravel, four iron pipe and four plank culverts, one plank bridge, and 900 yds. earth fill, 200 rods ditching. Road No. 3, Pigeon River Road in Crooks Township, from Cloud River to Cloud Bay, two miles new road cleared, stumped and grubbed, 240 rods corduroyed and four spruce culverts built. Road No. 4, between Lots 9 and 10, Concession 1, and a bridge across the Slate River, Blake Township, graded and surfaced with earth 480 rods, ditched 480 rods, repaired one tamarac and pine bridge, span 62 ft. Road No. 5, from the N.E. corner of Lot 11, Concession 6, east to N.W. corner, Lot 9, Concession 6, thence south between Lots 9 and 10 to the blind line, Blake Township, 480 rods new road graded and surfaced with earth, and nine wood culverts placed.

Neelon and Garson By-law No. 77.—Road No. 5, between Lots 3 and 4, Concessions 2 and 3 Garson, one mile of old road graded and ditched on both sides, and three wood culverts placed. Road No. 6, Lots 4 to 7, Concession 3 Gar-

son, one mile of old road graded and ditched on both sides and three wood culverts. Road No. 7, from Lot 3, Concession 5, north, one mile, 160 rods new road cleared and ditched and two wood culverts. Road No. 8, between Lots 10 and 11, Concessions 2 and 3 Garson, one mile of new road cleared 66 ft. Road No. 9, Tessier Corner to Pilote Corner, Concession 2 Neelon, one mile of old road graded and ditched on both sides. Road No. 10, from Lot 10, Concession 5, to Lot 2, Concession 5 Neelon, five miles of old road graded. Road No. 11, between Lots 8 and 9, Concession 1 and 2 Neelon, two miles of old road graded and 160 rods ditched. Road No. 12, between Concessions 5 and 6, Lots 7 to 12, three miles old road graded and ditched, and three wood culverts. Road No. 13, Trunk Road to C.P.R. Station, Neelon, two miles of old road graded. Road No. 14, Concession 4, across Lot 2 Neelon, ½ mile of new road cleared, stumped and grubbed.

O'Connor By-law No. 75.—Road No. 1, O'Connor and Paipoonge townline, Concessions 3-4, ½ mile of old road graded and surfaced with earth and two plank culverts placed.

Oliver By-law No. 154.—Road No. 1, Oliver and Paipoonge Boundary, Lots 8 to 11, ½ mile of new road cleared, stumped, graded and surfaced with earth, and two wood culverts built, one mile of old road graded, surfaced with earth and three iron culverts placed. Road No. 2, 6th sideline, across Concessions 2 and 3, one mile of new road cleared, stumped and grubbed, and one mile of old road cleared and crowned with earth. Road No. 3, 6th sideline, across Concession 6, one mile of new road cleared, stumped and grubbed, 160 rods graded and surfaced with earth, 100 rods corduroyed, and three wood culverts placed. Road No. 4, the 6th sideline, across Concession 6, ½ mile of new road cleared, stumped, graded, surfaced with earth and ditched, three cedar culverts, ½ mile of old road graded and surfaced with earth. Road No. 5, on the 1st sideroad, across Concession 1, one mile of new road crowned with earth, 30 rods having to be cleared, 160 rods stumped and grubbed, 320 rods graded, and 80 rods, corduroyed, ditched 375 rods, and two tamarac culverts. Road No. 6, on the 1st sideroad across Concessions 4 and 5, ¼ mile of old road was repaired and surfaced with gravel, and one mile of new road cleared, stumped and grubbed, 75 rods crowned with stone, and 160 rods with gravel, 100 rods ditched.

Paipoonge By-law No. 128.—Road No. 1, south on the south sideline from the pole line, 400 rods of new road cleared, stumped, grubbed and ditched on both sides, eight iron and one wood culvert placed. Road No. 2, Roslyn Road, from Neebing Boundary west to new bridge, 1,333 yds. of gravel hauled on 720 rods of old road. Road No. 3, the 30th sideline from Arthur St. North, 400 rods of new road cleared, stumped and grubbed, 320 rods graded and surfaced with earth, and five iron culverts placed. Road No. 4, Concession 1, from 20th sideline west, cut on hill 10 rods 200 yds., graded 160 rods, surfaced 160 rods, half with earth and half with gravel. Road No 5, west from the 15th sideline on Concession 2, 1½ miles of old road graded and crowned with earth. Road No. 6, 10th sideline south from Concession 2, graded 100 yds., surfaced with earth 150 rods, cut down two hills, filled in 1,114 yds. with earth, and gravelled 14 rods, three iron culverts placed. Road No. 7, west from 15th sideline on Concession 4, graded and surfaced 420 rods, cut down a hill removing 200 yds. of earth, and built two plank culverts. Road No. 8, from new bridge to Concession 1, 40 rods gravelled and three iron culverts placed. Road No. 9, from the Stanley bridge east to the 25th sideline on Concession A, south of the river, 480 rods resurfaced with gravel and

two wood and three iron culverts placed. Road No. 10, Concession 1, south of the river from Concession C east, 240 rods graded and surfaced, filled in 100 rods swamp and ditched it. Road No. 11, Stanley-O'Connor Road, from Stanley west, ½ mile of new road cleared, stumped and grubbed, 100 rods old road graded and ditched on both sides, and two cedar culverts built.

Plummer Additional By-law No. 132.—Garden Bay Road, between Concessions 2 and 3, sidebrushed 140 rods and gravelled 35 rods. Road No. 2, Geoffrey Road, between Concessions 3 and 4, across Lots 2 and 3, sidebrushed 130 rods, graded 100 rods, and gravelled 70 rods. Road No. 3, Cloudslee Road to Boundary, 65 rods graded and covered with gravel. Road No. 4, Rydal Bank Road, Concession 3, 235 rods graded and 125 rods gravelled. Road No. 5, between the 5th and 6th Concession, Cuthbertson Location and Plummer Additional, to Keating Location, 170 rods crowned with gravel and one culvert placed. Road No. 6, road to Caribou, between Keating and Cuthbertson Location, 40 rods stumped and grubbed, 75 rods graded, 35 rods gravelled and earth cut 200 yds. Road No. 7, through the centre of Keating Location, 80 rods sidebrushed and graded, 100 rods crowned with gravel and one wood culvert built. Road No. 8, between Concessions 3 and 4, Keating, westerly to Portlock, 80 rods of old road surfaced with gravel.

Prince By-law No. 47.—Road No. 1, between Sections 36 and 35, 310 rods graded, 55 rods gravelled, and five tile culverts placed. Road No. 2, townline from the baseline north, improved one mile of old road, 60 rods being gravelled and 25 rods of old ditch deepened. Road No. 3, on the 2nd line from the townline west, gravelled 60 rods, filled in washout 70 rods and 48 rods of ditch deepened, one tile culvert placed. Road No. 4, on the baseline west from the line between Sections 35 and 32, 1½ miles of old road improved by cleaning out the ditch, regrading 90 rods and surfacing 64 rods with gravel. Road No. 5, on the 2nd line west from the line between Sections 33 and 34, 140 rods sidebrushed, 84 rods gravelled, filled in washout 15 yds. and placed one wood culvert. Road No. 6, Creek Road, N.W., direct from Section 24, three miles of old road improved, 100 rods sidebrushed, 59 rods graded, 165 rods ditched, sidehill cut 265 yds., fill 128 yds., new cedar covering put on an old bridge and four wood culverts placed. Road No. 7, Haines Road, from the 2nd line in a north-west direction, 1¼ miles of old road repaired by spreading 41 yds. of gravel where needed, deepening 6 rods old ditch and making a fill of 200 yds. earth. Road No. 8, west from the Forks of the Haines Road, one mile of old road repaired by spreading 27 yds. of gravel where needed, fill of 338 yds. earth and building 219 ft. ditch.

Rayside By-law No. 118.—Road No. 1, between Concessions 1 and 2, across Lots 7 to 10, 1½ miles of old road improved, 320 rods being graded, 160 rods cleared and 480 rods ditched and four wood culverts built. Road No. 2, across Concession 3, between Lots 4 and 5, 1½ miles of old road improved, cleared 160 rods, stumped and grubbed 80 rods, graded 400 rods, ditched 800 rods and placed three stone culverts.

Sandfield By-law No. 195.—Road No. 1, from Lots 1 to 18, Concession 2, and from Lots 1 to 7, Concession 3, 50 rods old road graded, 125 rods gravelled, and two wood culverts placed. Road No. 2, between Concessions 2 and 3, from Lots 8 to 30, and between Concessions 4 and 5, from Lots 5 to 14, old road graded 25 rods, gravelled 120 rods, and two wood culverts built. Road No. 3, Lot 14, Concession 4, to Lot 18, Concession 8, 100 rods of old road gravelled and one wood culvert repaired. Road No. 4, between Concessions 8 and 9, Lots 18 to 30, 85

rods of old road gravelled and three wood culverts. Road No. 5, road from Concession 8, Lot 18, north to Concessions 10 and 11, graded 50 rods, crowned 190 rods with gravel, stone fill 5 yds. and two wood culverts.

Shuniah By-law No. 391.—Road No. 1, extension of road in McGregor Township, 1½ miles cleared, stumped and grubbed, 80 rods graded and surfaced with earth and two jack pine culverts built. Road No. 1 A, along the southerly boundary of Lot 16, Concession A, McGregor, ½ mile of new road cleared, stumped, and graded and surfaced with earth, and one tamarac culvert. Road No. 2, boundary line of Port Arthur, one mile of new road requiring three cedar culverts was cleared, stumped, graded and surfaced, and three miles of old road improved by grading 640 rods, crowning with earth 640 rods, resurfacing with gravel 760 rods and building three cedar culverts. Road No. 6, Centre Road from the Oliver Road to Dawson Road, in McIntyre, two miles of old road improved, graded 320 rods, surfaced with earth 330 rods and resurfaced with gravel 320 rods. Road No. 7, east, two miles from Section 27, on the Townline, and North ½ mile to Dawson Road, ½ mile of old road graded and levelled and 80 rods resurfaced with gravel. Road No. 8, between Sections 4 and 19, 5 and 18, 6 and 17, 7 and 16, McIntyre, ½ mile of old road graded and crowned with earth. Road No. 9, road through mining locations 27 to 32, 1½ miles of new road cleared 66 ft., 160 rods stumped and grubbed, and ½ mile of old road resurfaced with earth and ditched and one plank culvert placed. Road No. 10, road on centre of Sections 17 and 6, one mile of old road graded, ditched and surfaced with earth. Road No. 14, due west from the 3½ mile post on the Dawson Road, McIntyre, ¾ mile of old road improved by grading and levelling 160 rods, resurfacing with shale rock 80 rods, and ditching 80 rods. Road No. 15, from the Dawson Road, Lot 29, Concession B, north to the Township of Ware, 220 miles of new road cleared, stumped, graded and surfaced with earth and five wood culverts placed. Road No. 16, east boundary of Lot 22, Concession A, ½ mile of new road cleared, stumped, graded, ditched and surfaced with earth and 40 rods resurfaced with clay and gravel. Road No. 16 A, from the N.E. corner of Section 31, north through Lot 28, White's survey, ¾ mile of new road cleared, 80 rods stumped, graded, surfaced with earth and ditched on both sides, one cedar culvert and one 18 ft. plank bridge built.

St. Joseph By-law No. 406.—Road No. 1, Huron-Neebish Road, Lots 18 to 25, one mile of old road graded and 120 rods covered with gravel. Road No. 2, in front of Lot 24, Concession A, 480 rods of old road graded and 175 rods covered with gravel. Road No. 3, Concession 3, Lots 1 to 10, ½ mile of old road improved, graded 60 rods, gravelled 70 rods, cut and fill 260 yds. Road No. 4, between Concessions D and E, Lots 6 to 10, graded 90 rods, crowned with gravel 100 rods. Road No. 5, across Concessions G and H, from 10th sideroad, 1½ miles of old road brushed on each side and surfaced with gravel. Road No. 6, between Concessions 8 and 9, from Lots 10 to 20, one mile of old road sidebrushed and 180 rods gravelled. Road No. 7, between Lots 15 and 16, across Concession D, one mile of old road cleared and boulders removed, 30 rods graded and covered with gravel.

Tarbutt and Tarbutt Additional By-law No. 8.—Road No. 1, between Lots 4 and 5, across Concessions 6A and 1T, 195 rods of old road surfaced with gravel and two tile culverts placed. Road No. 2, between Lots 6 and 7, across Concessions 5 and 6, Ta and 1T, one mile of old road graded and gravelled and three tile

culverts built with concrete ends. Road No. 3, between Lots 8 and 9, across Concession 6 T.A., 125 rods old road graded and 47 rods covered with gravel.

Tarentorus By-law No. 137.—Road No. 1, St. Mary's and Tarentorus Townships, from the Great Northern Road west to the road in Section 31, and south through Section 31 to the boundary of Tarentorus, 60 rods graded, 160 rods crowned with gravel and fill 200 yds. Road No. 3, Section 31, Tarentorus, and Lot 6, graded 90 rods, surfaced with gravel 480 rods. Road No. 4, Garden River Road, from Section 1 to Rankin Location, 292 ft. old road cleared 12 ft. on each side, 179 rods gravelled, one iron and one concrete culvert and a fill of 531 yards. Road No. 5, Northern Road from McNab Street to the 5th line, 1,280 rods covered with gravel and four iron culverts placed. Road No. 6, the 5th line from the Great Northern road to the Landslide road, 249 rods cleared 12 ft. on each side and 480 rods gravelled. Road No. 7, Garden River Road, from the 3rd line, across Section 31, Tarentorus, 170 rods cleared 12 ft. on each side, 70 rods crowned with gravel, 20 rods ditched, cut 326 yds. earth, rock fill 222 yds., earth fill 1,072 yds.

Tehkummah By-law No. 206.—Road No. 1, from the Government road to the 6th line on the 5th sideroad, 80 rods graded, 175 rods gravelled. Road No. 2, between Lots 17 and 18, Concession A, and between Concessions A and B, Lots 11 and 12, graded 110 rods, gravelled 160 rods and one wood culvert built. Road No. 3, the 10th sideroad from 8th line to South Bay Mouth, graded and gravelled 80 rods, fill 25 yds. stone. Road No. 4, Lots 30 and 31, between A and B Concessions, 50 rods graded and gravelled. Road No. 5, 5th sideroad, Concession 1, 100 rods graded, 60 rods gravelled, and one culvert repaired. Road No. 6, B line from the 5th sideroad to the 10th sideroad, 110 rods new road graded and 70 rods covered with gravel. Road No. 7, Sandfield and Tehkummah townline, Lots 6, 7, 8, 65 rods covered with gravel. Road No. 8, second line from the 10th sideroad, across Lots 10 and 8, and road between Lots 26 and 27, 65 rods road crowned with gravel and one 16 ft. wooden bridge repaired. Road No. 9, from the 4th to the 6th lines, 160 rods old road graded, 100 rods gravelled and one wood culvert built. Road No. 10, from the north end of Lot 11 to the 4th line, 140 rods of old road gravelled. Road No. 11, from the 2nd to the 4th line on the 15th sideroad, 90 rods of new road graded and gravelled. Road No. 12, opposite Lots 17 and 18, on the 4th line, 25 rods gravelled, one wood culvert built and one 16 ft. timber bridge repaired. Road No. 13, second line from the 10th sideroad to Lot 22. Crowned with earth and gravel 75 rods, fill of stone 30 rods, averaging 15 in. in depth. Road No. 14, north, on the 20th sideroad, from the 2nd line, 75 rods graded and 60 rods gravelled.

Thessalon By-law No. 14.—Road No. 1, west of the river to the C.P.R. crossing, 57 yds. of old road graded and gravelled. Road No. 2, south from Little Rapids Bridge, on Little Rapids Road, graded and gravelled 118 rods. Road No. 3, east from the N.W. quarter of Section 27, graded and gravelled 21 rods. Road No. 4, road west from Feltham Corners, graded 160 rods, gravelled 20 rods. Road No. 5, road north from Feltham Corners, 18 rods crowned with gravel. Road No. 6, north from Livingstone Creek, 10 rods of new road cleared 66 ft. and five rods of hill improved.

Worthington By-law No. 57.—Road No. 1, between Lots 40 and 41, north from the Colonization Road, 196 rods of old road graded and gravelled, and one wood culvert built. Between Lots 16 and 17, one mile of new road cleared, stumped and graded 28 ft. wide, and three wood culverts placed.

West Division.

Ahmic Harbour Road.—Lots 6, 7, 8, Concession 8, Croft. A new deviation around a rocky hill, 108 rods in length was made and ditches blasted to carry off the water, 2 stone culverts were placed and 132 rods of old road were improved.

Alsace Road, Lots 10 to 14, Concession 2.—Nipissing Township, one mile of old road improved by cutting down hill and filling at bottom, blasting out a water course, grading 80 rods and covering with stone, placed one stone culvert, cut 160 rods.

Armour, Concession 3, Lot 12, north to Concession 5.—One heavy hill cut down, graded, gravelled and ditched, 86 rods in length, one stone culvert placed on Lot 13, Concession 3.

Axe Lake Road.—Lots 2 to 28, Concession 8, McMurrich, 1½ miles of old road improved by cutting down hills, grading and ditching 480 rods and placing 3 cedar culverts.

Balsam Road, between Concession 3 and North Road, McKellar Township.—One mile of old road graded and ditched; considerable blasting was required to make the ditches.

Baysville-Bracebridge Road, McCaulay.—Lots 27 to 30, Concession 6, 1½ miles of old road were improved by clearing out the sides for 160 rods, grading 100 rods, hauling and spreading 500 loads earth and 20 loads gravel, building 4 stone culverts, ditching 200 rods, removing old corduroy and levelling with earth and 250 loads of stone, and blasting out ditch on side of hill.

Baysville Road, Lot 16, Concessions 9 and 10, Brunel.—Three hundred rods of road were cleared out to make a deviation around a bad hill, 320 rods stumped and grubbed, graded and crowned with gravel, boulders were removed and 4 wood culverts placed.

Bellow Hill, Concessions 5 and 6, Nipissing.—On the 5th sideroad, across Concessions 5 and 6, ¾ mile of road improved by cutting down hills, filling in, grading and ditching 240 rods, 2 stone culverts placed and small earth fills made.

Bethune, Concession 12, Lots 17 to 25.—One and one-half miles of old road graded and ditched, 10 rods of swamp gravelled, one large hill cut down and filled in at the bottom and 5 cedar culverts placed.

Black Road Station to Alexander Vankoughnet's.—From Lot 10, Concession 3, Foley, to Lot 12, Concession 12, Conger, 560 rods of old road cleared, stumped, graded and ditched, the ditches required some blasting.

Brown Swamp, Nipissing and Restoule Road.—Two miles of old road improved by brushing out the sides for 220 rods and spreading 300 loads of earth over 250 rods.

Brunel Road north of Port Sydney.—Two and one-half miles of old road improved by grading and brushing out the sides for 600 rods, blasting out ditches on a rock hill and gravelling 48 rods, removing 10 rods pine stumps, placing 8 wood culverts and building one 13 ft. timber bridge.

Bull's Run Hill on Huntsville-Dorset Road.—From Lot 1, Concession D, to Lot 6, Concession 5, Franklin, 5 miles of old road were generally repaired, 320 rods sidebrushed, 1,000 rods graded, 400 rods crowned with gravel and 5 wood culverts placed.

Bury Road from Townline Lindsay and St. Edmunds.—One mile of new road constructed, being between ridges of rock for part of distance; 200 rods cleared, 320 rods stumped and graded, 150 rods surfaced with earth, 4 rods corduroyed,

stone fill, 1,230 rods, earth fill 360 yds., one wood culvert and one 20 ft. timber bridge built.

Byng Inlet to C. P. R. Station.—Lot 45, Concession 12, to Lot 42, Concession 11, Wallbridge; general repairs made on 3½ miles of old road by grading 600 rods, surfacing with earth 200 rods and gravelling 42 rods, one stone culvert placed.

Carling, Blind Line, Concessions 11 *and* 12, *Lots* 68 *to* 70.—Three-quarters of a mile of new road cleared, stumped and graded.

Chaffey, between Lots 10 *and* 11, *Concessions* 12 *to* 14.—One hundred and sixty rods of new road opened up being a deviation around a sand hill, 160 roads cleared, 120 rods stumped, 100 rods graded and surfaced with earth and 2 wood culverts placed.

Chaffey, 25th sideroad, Concessions 11 *and* 12.—One and one-half miles of old road repaired by sidebrushing 320 rods, grading 200 rods, spreading 106 loads of earth and building 11 wood culverts.

Chapman, 10th sideroad, Concession 11.—One mile of old road improved by cutting down hill 5 ft., grading 320 rods, surfacing 220 rods with earth, 2 wood culverts.

Christie Road north of Edgington.—Lot 14, Concession 11, Christie, 136 rods of new road cleared, graded and ditched, making a deviation around 2 large hills, 3 stone culverts placed.

Clay Hill repairs.—Lots 7 to 12, Concession 6, Armour. One and one-half miles of old road improved by cutting down hill and filling in with stone at bottom, grading 80 rods, surfacing with stone 80 rods, ditching 400 rods and building 2 stone culverts.

Coldwater Road, Concessions 12 *and* 13.—Lots 14 and 15, Medonte, 165 rods of old road covered with gravel.

Commanda Lake Road.—From Lot 29, Concession 3, to Lot 32, Concession 1, Patterson, 1¾ miles of old road were improved, 320 rods graded, 320 rods crowned with earth and 250 loads of gravel, 2 wood culverts built.

Commanda and Trout Creek Road.—Lots 1 to 3, Concession 5, Gurd, ½ mile of old road graded, ditched and gravelled and 2 stone culverts placed.

Distress River Road.—Lots 20 to 25, Concession 9, Strong, 1½ miles of old road improved, 350 rods graded, 586 loads of gravel hauled and spread on 350 rods, one iron culvert placed with stone abutments.

Distress Road, west from boundary of Chapman and Strong.—Lots 1 to 3 on boundary, ¾ mile of old road repaired by grading and ditching and placing one stone culvert.

East River Hills, Chaffey, across Lot 9, *Concession* 4, *Chaffey.*—One-half mile of old road improved by cutting down hills, grading 100 rods, surfacing with gravel 100 rods, putting in 2 wooden culverts and filling with 15 loads of stone.

East Road from Manitoumeba Dam to Waubaumac Junction.—Commencing at Lot 1, Concession 9, McDougal, 4½ miles of old road were improved by blasting out boulders and rock, cutting down one hill, sidebrushing and grading 1,200 rods.

East Road, Spence.—Commencing at Lot 7, Concession 9, and going westward, 3 miles of old road were improved by grading, ditching, blasting and general repairing. Graded 400 rods, surfaced with earth 300 rods, with gravel 50 rods and 3 wood culverts built.

Ferguson Road.—Lots 3, 4, 5, Concession 4, and Lots 5 and 6, Concession 3, 1¼ miles cleared and graded, one log bridge repaired, 420 rods ditched.

Ferguson and McKellar boundary.—Lots 1 to 4, 1¼ miles of old road improved, sidebrushed 93 rods, graded 406 rods, crowned with earth and broken stone 400 rods, ditched 406 rods, one wood bridge repaired and 3 stone culverts built.

Franklin Peninsula to Lake of Bays.—One and one-half miles of new road constructed by cutting out trees and brush, grading and ditching around a series of large hills, 4 wood culverts built and fill 300 yds. of stone and 4 wood culverts.

Fraserburg-Bracebridge Road.—Lots 17 to 30, McCauley, 4 miles of old road were improved by removing stone, boulders, brushing out sides of road for 400 rods, grading 300 rods, hauling 207 loads of earth and spreading one load deep, ditching and rounding up the road; one wood and one stone culvert.

Fish Lake Road.—Lots 21 to 24, Concession 1, Perry, 320 rods of old road graded and crowned with gravel and 3 wood culverts placed.

German Road, Lots 18 to 2, Concession 12, Mills.—One hundred and eighty rods of new road opened up by clearing, stumping and grubbing 132 rods, grading and ditching 88 rods.

Great North Road, between Commanda and Golden Valley.—Lot 6, Concession 9, to Lot 35, Concession 7, Pringle, 10 miles of old road improved by grading 3,000 rods, surfacing 1,000 rods with earth, blasting ½ mile, gravelling and putting in 5 cedar culverts.

Gurd, between Concessions 4 and 5, Lots 27 to 30.—One mile of old road improved by grading 320 rods, gravelling 200 rods and building 4 wood culverts.

Gurd and Machar boundary, Lots 10 to 15.—One-half mile of old road improved by grading 115 rods and blasting 115 rods.

Himsworth, 20th sideroad, Concessions 16 and 17.—Lots 20 and 21 South Himsworth, ¾ mile of old road repaired by cutting down very heavy hills, ditching and grading 240 rods and placing 3 stone culverts and making a small fill.

Huntsville Road to Hiram Fetterley's.—Muskoka Road in Chaffey, crushed broken stone with crusher, graded and surfaced with broken stone, 320 rods of old road.

Jerusalem Road, between Concessions 12 and 13, across Lots 1 to 4.—Machar Township, one mile of new road cleared, chopped, graded and ditched, 3 cedar culverts placed.

Joly, between Concessions 10 and 11.—Across Lots 1 to 7, 640 rods graded, 500 rods gravelled, rock and boulders blasted out and one wood culvert built.

Kearney to Orange Valley, Lots 27 and 28, Concession 2, Armour.—Three-quarters of a mile of new road was cleared, graded and ditched and 126 rods covered with gravel.

Lake Siding to Deer Lake.—Two miles of old road improved by removing boulders, grading 300 rods, hauling gravel and spreading over 100 rods, and building 2 wood culverts.

Loring and Arnstein Road.—Lot 35, Concession 14, to Lot 32, Concession 12, Mills, 1¼ miles of old road graded, 300 rods covered with gravel, 4 wood culverts placed, blasted out rock and removed boulders.

Lount, 10th sideline from Eagle Lake Road to Nipissing Road.—One and one-half miles of old road improved by removing boulders, brushing out 320 rods, stumping 100 rods, grading 320 rods, spreading 200 loads of gravel over 320 rods, ditching 100 rods and building 4 wood culverts.

Machar, 10th sideroad.—Concessions 8 and 9, 180 rods old road sidebrushed, graded and ditched.

Medonte, between Lots 20 *and* 21, *across Concessions* 11-12.—One hundred and forty-seven rods of new road were opened up to give access to C. P. R. Station at Coldwater Junction, through swampy ground, 90 rods were stumped, grubbed, ditched, 147 rods graded, 90 rods gravelled and a stone fill of 53 yds.

Medonte, between Concessions 10 *and* 11, *across Lots* 17 *to* 20.—One hundred rods of new road were opened across a deep ravine, 20 rods cleared 66 ft. 80 rods stumped and grubbed, 100 rods graded, one concrete culvert built and a fill of 1,210 yds. of earth and stone.

Mill Lake Road, between Lots 16 *and* 17, *Concession* 3, *McDougal.*—One hundred and twenty rods of new road chopped out, graded and ditched, 3 cedar culverts placed.

Mills, Lot 24, *Concession* 8, *to Lot* 22, *Concession* 7.—Two miles of new road were cleared and graded, 640 rods stumped and boulders removed.

McCoy Hill Deviation.—Between Lots 18 and 19, Concession 1, McDougal, a large hill was cut down, graded and ditched, thus improving ½ mile of old road.

McMurrich, 20th sideline, across Concessions 1, 2, 3.—Two miles of old road were repaired by removing boulders, ditching, grading 400 rods and covering it with earth, one wood culvert placed.

McMurrich, 5th sideroad, G. T. R. to Doe Lake.—Three miles of general repairing, grading and ditching 300 rods, clearing and surfacing with earth 100 rods, removing boulders, hauling and spreading gravel on 100 rods and building 4 wood culverts.

Mortimer's Point to Port Carling.—Lot 28, Concession 3, Medora, a deviation 200 rods in length through green bush was made to avoid bad hills, considerable rock and several stumps blasted out, 200 rods being cleared, stumped, graded and crowned with earth and 2 wood culverts built.

Muskoka Road north, on the 14th Concession Orillia.—Three hundred and sixty rods new road cleared, 300 rods stumped, 50 rods graded, 300 rods crowned with earth, sand cut 230 yds. and one wood culvert.

Muskoka Road north of Utterson.—Two and one-half miles of old road improved by cutting down hill, spreading 50 loads of gravel and 10 loads broken stone, grading 800 rods and building one concrete culvert.

Nipissing from Lot 30, *Concession* 3, *to Lot* 16, *Concession* 7.—Six miles of general repair, brushing out side 400 rods, grading 600 rods, spreading earth and gravel over 300 rods and building 3 wood culverts.

Nipissing Road, Monteith, Lots 24 *to* 32, *Concessions A and B.*—Three miles of old road improved by brushing out the side 160 rods, removing boulders, grading 400 rods and crowning it with earth and putting in 2 wood culverts.

Nipissing, 10th sideroad, Concessions 4 *to* 6.—Three miles of old road repaired, 600 rods graded, 320 rods surfaced with earth and two wood culverts placed.

North Cardwell Road Deviation.—Lot 35, Concession 12, and hill on Lot 32, Cardwell, a deviation 80 rods in length was cleared, stumped, graded and 2 wood culverts placed to avoid a steep hill, and on Lot 33 a hill was cut down 40 rods being graded and crowned with earth.

North Himsworth, east boundary Concessions 13 *and* 14.—One hundred and twenty rods of new road were graded and ditched and a 26 ft. cedar bridge erected.

Nipissing Road in Chapman.—Four miles of old road were improved by ditching and removing boulders, 800 rods graded, 300 rods surfaced with earth and four wood culverts built.

Orillia, 4th Concession north of C. P. R.—One hundred and forty rods of old road covered with gravel, 30 rods graded and 20 rods ditched.

Orillia, 7th Concession north from North River.—A ledge of rock blasted out, 175 rods graded, 37 rods stumped and grubbed and a fill of 260 yds. earth and stone; new road.

Oro, Concession 12, *from Lots* 2 *to* 6.—Underbrushing 2 miles of new road through a swamp, cleaning out 2 creeks and removing logs, brush and stumps in order to give good drainage to the road; creek 120 rods and the other 130 rods.

Parry Sound Road, west from Redfern's Corners.—Between Concessions A and B, from Lots 84 to 88, Humphrey. One mile of old road repaired by grading 320 rods, blasting out 8 rods of ditch, spreading 12 rods of broken stone and cutting down 5 hills.

Peninsula and Stanley House Road.—Humphrey, Lots 4 to 9, Concession 6, on Peninsula Road and Lot 37, Concession 4, Stanley House Road. Five hundred and sixty rods of old road graded and ditched, cutting down several hills and making a fill 200 ft. in length.

Perry, Sideroad 31, *Concessions* 3 *to* 9.—Old road graded 135 rods, gravelled 103 rods, 2 wood culverts placed, 2 bridges repaired and 114 rods ditched.

Port Severn Road in Baxter.—Three miles of general repairs, removing boulders and filling in holes, sidebrushing 100 rods and placing 3 wood culverts.

Port Severn Road in Matchedash.—One hundred and five rods of old road located through small field, stone was covered over with earth and 3 wood culverts built.

Proctor's Hill, 15*th sideroad, Concession* 10, *Strong.*—One-half mile of old road was improved by blasting out the top of a hill and making a fill of 200 yds. of earth and 30 yds. of stone, 80 rods sidebrushed and graded and 3 stone culverts placed.

Restoule Lake Road.—On Concession 3, from Lot 25, Patterson, 180 rods of new road cleared and graded 20 ft. and one cedar culvert placed.

Rondville to Fox Point.—Lot 12, Concession 4, to Lot 12, Concession 3, Franklin, ½ mile of old road was improved by removing boulders, deviating to one side of a hill, brushing out 100 rods and grading 80 rods.

Round Lake Road.—Deviation in Perry, 200 rods cleared, stumped and graded, 50 rods crowned with earth, some blasting and general repairing.

Ryerson, Concession 10, *Lot* 24, *to Concession* 8, *Lot* 18.—Three miles of road repaired by grading 600 rods, gravelling 300 rods and building 2 stone culverts.

Sarawak Main Road.—Two hundred and eighty rods of old road improved, 140 rods graded, 80 rods covered with broken stone, 60 rods covered with gravel, stone fill 255 yds., gravel fill 50 yds.

Severn Bridge, north to the line between Concessions 11 *and* 12, *Muskoka Road.*—Three miles of old road repaired, 300 rods brushed out on each side, 600 rods graded, 567 loads of gravel and 96 loads of earth spread on the road and one wood culvert placed.

Skeleton Hills, Parry Sound Road.—Lot 24, Concession 13, Watt, 102 rods cleared, graded and surfaced with earth and broken stone, 37 yds. ditched, blasted out of solid rock, 3 x 2 ft.

South Himsworth, Concession 8, *Lot* 6.—One-half mile of new road was cleared, graded and ditched, requiring the cutting down of seven hills.

South Himsworth, 15*th sideroad, Concessions* 12 *and* 13.—One-half mile of old road improved by cutting down hill and gravelling. One hundred and twenty rods graded and ditched and one stone culvert built.

South Himsworth, Concessions 8 *and* 9, *Lot* 15.—One-half mile of old road was improved by cutting down a hill, placing a 40 ft. corrugated steel pipe under the fill; graded and ditched 80 rods.

Strong, 10th sideroad, Concessions 11 *and* 12.—One hundred and eighty-five rods of new road were cleared, stumped and graded and 4 wood culverts placed.

Strong, between Concessions 8 *and* 9, *across Lots* 9 *to* 12.—Four hundred and eighty rods graded, 320 rods surfaced with gravel and one stone culvert placed.

Strong, 20th sideroad, Concessions 10 *and* 14.—One hundred and eighty rods of old road stumped and graded, one stone culvert and one stone and wood bridge, having a span of 16 ft. was erected.

Strong, 5th sideroad, Concessions 7 *and* 8.—Four hundred rods of old road graded, surfaced with earth and ditched, boulders blasted out and one glazed tile culvert placed.

Tay, 2nd Concession, Lot 95.—Thirty-one rods of new road through a marsh were covered with brush and earth in order to get across the ice in the winter to Midland, thereby saving 4 miles of a drive each way.

Westphalia Road, on Concession 2, *from Lots* 2 *to* 21, *Gurd.*—Five miles of old road were improved by blasting out rock, grading 1,500 rods and crowning with earth 300 rods.

White Stone and Deer Lake Station Road.—On Concession 1, Lots 1 to 3, Burton. Two hundred and forty rods of old road graded and ditched, cut down hills and filled in at bottom.

Wood Lake Road.—Townline of Oakley and Draper, 4½ miles of old road improved by removing boulders, blasting out several pine stumps, blasting a cut through a hill, grading 640 rods, spreading 200 loads of gravel over 130 rods and putting in 2 wood culverts.

West Division By-laws.

Albemarle By-law No. 516.—Road No. 1, on the Townline of Eastnor and Albemarle, south to Lot 4, on the line between Concessions 2 and 3 W.B.R., also from Pattenela Bridge east on the 20th sideroad, between Lot 21, Concession 1, W.B.R., and Sky Lake, 175 rods old road gravelled and one wood culvert. Road No. 2, from Lot 13, south to Lot 21, also from Lots 23 to 29, between Concessions 2 and 3 E.B.R., 400 rods of old road covered with gravel, one tile culvert placed and 200 ft. of cedar railing built for guards to bridge. Road No. 3, from the 8th to 5th Concessions, 35th sideroad, and then south on the line between Lots 5 and 7 E.B.R., 100 rods of old road covered with gravel, 30 rods of which were graded. Road No. 4, from cemetery road on hill above Colpoy Bay village to shore road on the line between Concessions 7 and 8 E.B.R., then west along shore road to the Townline of Amable and Albemarle, also from the 8th to 5th Concessions E.B.R., on the sideroad between Lots 35 and 34, Concession 7 E.B.R., one mile of old road improved by making a stone fill 177 yds., a rock cut 25 yds., ditching 90 rods, placing a new plank covering on bridge, putting in one cement and one tile culvert, and covering 160 rods with gravel. Road No. 5, 20th sideroad from the 3rd to the 8th Concessions, 150 rods of old road surfaced with gravel and one tile culvert. Road No. 6, from the 7th Concession eastward on the deviation through Lot 10, Concession 8 E.B.R to the 9th Concession E.B.R., then south to the corner of Lot 10, Concession 9 E.B.R., then eastward on the 10th sideroad to the 10th Concession E.B.R., 320 rods of old road improved by grading 70 rods, surfacing with gravel 60 rods, with earth

60 rods, making a stone fill of 200 yds. and erecting one 12 ft. timber bridge. Road No. 7, between the 8th and 9th Concessions E.B.R. from the 5th sideroad to Eastnor Townline, 80 rods of old road crowned with gravel and rock cut of 50 yds. Road No. 8, 10th Concession E.B.R. and 25th sideroad, one new 16 ft. cement bridge erected. Road No. 9, between Concessions 12 and 13 E.B.R., Lots 23 to 25, 83 rods of old road graded and covered with gravel. Road No. 10, between Lots 20 and 21, Concession 13 E.B.R., 55 rods of old road graded and surfaced with gravel.

Amabel By-law No. 150.—Road No. 1, between Concessions 9 and 10, across Lots 15 to 20, 30 rods of old road graded and gravelled and one 14 ft. cedar bridge erected. Road No. 2, between Lots 5 and 6, across Concessions 8 and 23, one mile of old road graded, 200 rods covered with gravel, one 16 ft. wood bridge erected and a stone fill of 342 yds. Road No. 3, between Lots 9 and 10, across Concessions 1 to 4, 30 rods of old road graded and gravelled, 74 yds. earth fill. Road No. 4, Amabel and Keppel Townline, Concessions 4 to 6, 100 rods of old road graded and covered with gravel. Road No. 5, boundary Amabel and Keppel, Concession 2 S.C.D. to Concession 2 N.C.D., 430 rods of old road improved by grading 350 rods, surfacing with gravel 430 rods, and placing two wood culverts. Road No. 6, on the 10th sideroad, Concessions 8 to 12, 40 rods of old road repaired and one wood bridge 190 ft. in length rebuilt by putting in new stringers, crossbeams and covering. Road No. 7, 15th sideroad, from Concessions B to 5, 55 rods graded and 170 rods crowned with gravel. Road No. 8, 15th sideroad, Concessions 8 to 12, 50 rods of old road graded and gravelled. Road No. 9, on the 12th Concession from the 15th sideroad west to D. line, 60 rods of old road graded and gravelled. Road No. 10, on D. line, from Concessions 8 to 4, 130 rods of old road graded and gravelled and an earth fill of 200 yds. Road No. 11, on the Townline north of Wiarton, 60 rods of old road covered with broken stone. Road No. 12, Concession road west to Oliphant, 100 rods crowned and broken stone.

Chapman By-law No. 6.—Road No. 1, from Lot 83, Concessions A and B, north, 2½ miles of old road were graded, gravelled and ditched and six iron culverts placed. Road No. 2, easterly from Lot 97, Concession A, to Lot 16, Concession 1, 720 rods of old road graded, gravelled and ditched and three iron culverts placed. Road No. 3, easterly between Concessions 8 and 9, from the Nipissing Road, one mile of old road was graded, gravelled and ditched and five iron culverts placed.

Eastnor By-law No. 970.—Road No. 1, between Concessions 2 and 3, across Lots 4 to 1, 20 rods of old road gravelled and 315 rods ditched. Road No. 2, Concessions 1 and 2, and between Lots 10 and 11, 100 rods ditched and 30 rods covered with gravel. Road No. 3, across Concessions 7 and 8 in a north-westerly direction through Lots 13 and 14, 140 rods of old road gravelled. Road No. 4, between Concessions 2 and 3, across Lots 36 to 29, 50 rods of road gravelled and new plank covering put on bridge. Road No. 4A, between Concessions 2 and 3, in front of Lot 38 to boundary, 80 rods graded and 190 rods gravelled. Road No. 5, between Concessions 11 and 12, across Lots 7 to 10, 40 rods graded, 50 rods gravelled. Road No. 6, between Concessions 4 and 5, across Lots 37 to 40, 250 rods of old road gravelled. Road No. 7, between Lots 25 and 26, and acrosss Concessions 1 and 2, 156 rods of old road gravelled. Road No. 8, across Concessions 1 and 2 west, and between Lots 20 and 21, 137 rods of old road crowned with

gravel. Road No. 9, between Concessions 4 and 5, Lots 10 to 15, 70 rods of old road gravelled, new bent and stringer put on 40 ft. bridge and a stone fill of 53 yds. Road No. 10, between Concessions 2 and 3, across Lots 5 to 8, 250 rods of old road covered with gravel. No. 10A, across Concessions 1 and 2 east, and between Lots 15 and 16, 130 rods of old road covered with gravel and 160 rods ditched.

Hepworth By-law No. 16.—Road No. 2, County line of Grey and Bruce, across Concession 9, 100 rods of old road graded and gravelled. Road No. 3, northerly across Lot 30, Concession N.C.D. 2, 70 rods of old road graded and gravelled.

Joly By-law No. 141.—Road No. 1, between Concessions 4 and 5, across Lots 1 to 4, 240 rods old road graded and ditched. Road No. 2, between Lots 10 and 11, across Concession 11, 105 rods of old road graded and ditched.

Keppel By-law No. 11.—Road No. 1, between Concessions 19 and 20, from Lots 2 to 26, 12 rods of old road graded, 19 rods gravelled, 100 rods covered with broken stone, and six rods ditched. Road No. 2, between Lots 25 and 26, across Concessions 17 to 24, 280 rods of old road crowned with gravel. Road No. 3, from Lots 14 to 18, across Concession 7, 50 rods crowned with broken stone Road No. 4, from Concessions 16 to 19, on Boundary Keppel and Amabel, 440 rods covered with broken stone. Road No. 5, between Concessions 21 and 22, from Lots 10 to 20, 120 rods of old road graded and covered with broken stone and 100 rods sidebrushed. Road No. 6, between Concessions 23 and 24, Lots 1 to 20, 17 rods graded, 78 rods covered with broken stone and one wood culvert placed. Road No. 7, between Lots 40 and 41, across Concessions 18 and 19, 140 rods graded and crowned with broken stone and one tile culvert. Road No. 8, between Lots 20 and 21, across Concessions 22 and 23, 80 rods of old road graded and crowned with broken stone. Road No. 9, between Concessions 24 and 23, from Lots 37 to 40, 80 rods graded and crowned with broken stone. Road No. 10, south diagonal road from Lot 31 to 35, 170 rods of old road gravelled. Road No. 11, across Concession 1, S.C.D., L. N.C.D. and 2 N.C.D., between Lots 20 and 21, 20 rods graded, 20 rods gravelled, 95 rods surfaced with broken stone and earth cut of 40 yds. Road No. 12, between Lots 25 and 26, across Concessions 11 to 15, 50 rods graded and gravelled, 149 rods crowned with broken stone. Road No. 13, across Concessions 1 S.C.D., 1 N.C.D., 2 N.C.D., between Lots 30 and 31, 64 rods of old road surfaced with gravel. Road No. 14, between Concessions 15 and 16, from Lots 17 to 19, 20 rods graded and 26 rods covered with broken stone. Road No. 15, running in S.E. direction through Lots 27 to 30, across Concessions 8 to 11 inclusive, 70 rods of old road graded, and 110 rods crowned with broken stone. Road No. 15A, the south diagonal road from Lots 1 to 10, 87 rods graded and 207 rods crowned with gravel. Road No. 16, between Concessions 3 and 4, from Lots 5 to 19, 48 rods gravelled, earth cut 210 yds., fill 220 yds. Road No 17, between Lots 17 and 18, across Concessions 4 and 5, 60 rods of old road graded and 30 rods covered with broken stone.

Lindsay By-law No. 205.—Road No. 1, on the line between Concessions 4 and 5 E.B.R., from Lots 1 to 15, 2¾ miles of old road improved by sidebrushing 250 rods, grading 140 rods, gravelling 139 rods, and placing three wood culverts. Thirteen rods of new road were graded and gravelled and a rock fill of 11 yds. made Road No. 2, between Concessions 4 and 5 E.B.R., Lots 15 to 25, five miles of old road improved by sidebrushing 192 rods, grading 131, gravelling 184 rods, ditch-

ing 242 rods, and putting in two new culverts. Road No. 3, between Concessions 2 and 3 W.B.R., from Lots 1 to 15, 113 rods of old road were crowned with gravel and five rods graded. Road No. 4, between Concessions 2 and 3 W.B.R., from Lots 15 to 30, and on the line between Concession 1 E. and Concession 1 W., from Lot 30 to 35, 240 rods of old road gravelled, one wood culvert placed, and a rock fill of 8 yds. Road No. 5, 30th sideroad from Concessions 2 and 3 W.B.R. to Concession 1 E. and W., 96 rods of old road improved, stumped and grubbed 10 rods, graded 50 rods, gravelled 96 rods, rock fill 35 yds., and three stone culverts. Road No. 6, on the 35th sideroad, Concession 1 E. and W. to Georgian Bay, 140 rods of old road covered with gravel. Road No. 7, Lots 36, 37, 38, 39, 40, Concession 3 E.B.R., Mail Route, 330 rods of old road improved, cleared 90 rods, graded 96 rods, ditched 150 rods, surfaced with broken stone 30 rods, and with gravel 300 rods. Road No. 8, 5th sideroad, Concessions 2 and 3 W.B.R., Concessions 4 and 5 E.B.R., 185 rods of old road improved by grading 75, gravelling 112, and putting in one wood culvert. Road No. 9, on the line between Concession 1, E. and W. from Lots 1 to 10, 112 rods gravelled, 15 rods graded, and 16 yds. of rock blasted out. Road No. 10, on the line between Concessions 2 and 3 E.B.R. from Lots 1 to 5, 100 rods of old road were improved by grading 60 rods and crowning 100 rods with gravel.

Machar By-lay No. 476.—Road No. 1, between Concessions 4 and 5, from Lots 10 to 15, ¾ mile of old road was graded, ditched, and surfaced with gravel and two wood culverts built. Road No. 2, the 5th sideroad across Concession 5, ¾ mile of old road graded, gravelled and ditched. Road No. 3, north from line between Concessions 4 and 5 on deviation 15th and 20th sideroads, across Concessions 6 and 7, and between Concessions 8 and 9, to Lot 25, 2½ miles of old road were repaired by grading and ditching 640 rods and surfacing with gravel 160 rods.

Matchedash By-law No. 165.—Road No. 1, between Concessions 1 and 2, Lots 4 to 17, 1¼ miles of old road improved by grading 160 rods, surfacing 120 rods with gravel, 200 rods with earth, and making an earth fill of 100 yds. Road No. 2, between Concession 4, across Concessions 1 to 4, 1½ mile of old road repaired, stumped and grubbed 60 rods, graded 320 rods, and surfaced with earth 160 rods. Road No. 3, between Lots 6 and 7, across Concession 3, 160 rods of old road improved, graded 120 rods, crowned with earth 40 rods, with gravel 50 rods, two concrete culverts placed. Road No. 5, between Concessions 3 and 4, across Lots 4, 5, 6, 120 rods of new road cleared, stumped and grubbed, and a fill of 100 yds. of earth and rock made, 203 rods of old road were graded, and one iron culvert placed.

Medonte By-law No. 524.—Road No. 1, between Concessions 5 and 6, Lots 15 to 17, 240 rods of old road graded, 30 rods sidebrushed, 80 rods ditched, 60 rods covered with earth. Road No. 2, Lots 13 to 24, on Concessions 2 and 3, 15 rods of new road, a cut of 700 yards of earth, fill of 700 yds., old road repaired 180 rods, stumped and grubbed 100 rods, graded 180 rods, crowned with earth 100 rods, ditched 50 rods, and one concrete and one stone culvert placed. Road No. 3, across Lots 49 and 50, Concession 1, five rods of old road improved by putting in a concrete culvert, having concrete abutment and a cedar top, four rods of gravelling. Road No. 4, Tay and Medonte Boundary, Concessions 5 to 11, 106 rods graded, 260 rods gravelled, 10 yds. rock fill and one tile culvert. Road No. 5, Medonte and Orillia Townline, Concession 3, graded 68 rods, crowned with

gravel 155 rods, one 32 ft. timber bridge built, and earth fill 50 yds. Road No. 6, between Lots 10 and 11, across Concessions 2 to 6 inclusive, 20 rods of old road improved by making a 1,500 yds. earth cut and a 1,530 yds. earth fill. Road No. 7, between Concessions 9 and 10, Lots 1 to 13, 20 rods of old road improved by making an earth fill of 1,463 yds. and a stone fill of 20 yds. Road No. 8, between Concessions 7 and 8, across Lots 6 to 8, 100 rods of old road improved, 87 rods graded, 85 rods covered with gravel, earth cut 350 yds., earth fill 350 yds. Road No. 9, between Concessions 12 to 13, across Lots 5 to 12, 10 rods of old road improved by making an earth cut of 100 yds. and an earth fill of 200 yds. Road No. 10, line between Concessions 12 and 13, at Lot 15, 20 rods of old road graded, 120 yds. cut and 120 yds. fill. Road No. 11, between Concessions 10 and 11, across Lots 16 to 24, 100 rods of new road cleared, 18 rods graded, 38 rods surfaced with earth, 50 rods ditched and two wood culverts placed. Road No. 12, between Lots 20 and 21, across Concession 11, 12 rods of new road cleared and 8 rods graded. Road No. 13, between Lots 20 and 21, across Concession 12, 120 rods of old road graded and 30 rods covered with gravel. Road No. 14, between Lots 5 and 6, across Concession 11, 23 rods of old road gravelled and 10 rods ditched. Road No. 15, between Concessions 5 and 6, across Lot 8, 20 rods of old road graded and gravelled. Road No. 16, between Concessions 6 and 7, across Lot 3, 20 rods of old road graded, earth cut 100 yds, earth fill 120 yds. Road No. 17, Townline of Oro and Medonte, Concession 9, 50 rods of old road graded and one 14 ft. wood bridge built.

Medora and Wood By-law No. 274.—Road No. 1, Humphrey and Medora Boundary, 1,200 rods of old road graded, 400 rods sidebrushed, 260 rods gravelled, and seven wood culverts placed. Road No. 2, 14th line from Conger to Lot 21, Concession 3, Medora, on the Lake Joseph Road, cleared 600 rods, graded 1,600 rods, crowned with gravel 110 rods, two wood culverts. Road No. 3, on the line between Cardwell and Medora, to Lot 21, Concession 3, then south to Lot 14, Concession 3, 1,300 rods of old road graded and 280 rods covered with gravel and nine wood culverts placed. Road No. 4, from Lot 14, Concession 5, to Lot 30, Concession 7, Wood, 2,000 rods of old road graded, 128 rods gravelled, and 100 rods ditched. Road No. 5, from Lot 30, Concession 7, Wood, south to the line between Wood and Muskoka, 600 rods of old road were graded, 100 rods crowned with gravel and eight wood culverts placed.

Monck By-law No. 403.—Road No. 1, between Concessions 5 and 6, across Lots 6 to 9, 40 rods of old road graded, 80 rods gravelled, and four hills cut down. Road No. 2, ¼ mile of new road opened up on Concession 7, across Lots 14 to 16, 40 rods graded and 40 rods gravelled. Road No. 3, from Lot 19, Concession 7, to Beaumaris Dock, old road cleared, stumped and grubbed 200 rods, graded 1,000 rods, surfaced with gravel 400 rods, and eight wood culverts built. Road No. 4, Lakeshore and Junction Road, Lots 25 to 35, Concession 13, old road stumped and grubbed 20 rods, graded 1,200 rods, and one iron culvert placed. Road No. 5, from Falconburg to Yeoman's Hill, old road stumped and grubbed 60 rods, graded 1,500 rods, gravelled 400 rods, six wood culverts. Road No. 6, from Lot 17, on Port Carling Road, to Dee Bank Road, blasting, removing rock and improving 200 rods. Road No. 7, from Lot 6, Concession 5, to Lot 6, Concession 6, along the siding, 1½ mile of old road improved by grading 400 rods and gravelling 120 rods Road No. 8, from Lot 21, Concessions 10 and 11, to Port Carling Road, 3½ miles of old road improved by grading 900 rods, gravelling 150 rods, and putting in four wood culverts. Road No. 9, from Lot

27, Parry Sound Road, west 1¼ miles on Concession 13, 1½ miles of old road were repaired, 400 rods being graded and 200 rods covered with gravel.

Mulmur By-law No. A.—Road No. 1, between Lots 15 and 16, across Concession 1, 115 rods of new road were cleared and underbrushed, 80 rods stumped, 55 rods graded, 60 rods corduroyed, 162 rods ditched, and one wood culvert built.

Muskoka By-law No. 268.—Road No. 1, Doe Lake Road, from Lot 1 westward to the Bracebridge Road, 3½ miles of old road were improved by sidebrushing 40 rods, blasting out nine pine stumps, grading 50 rods, gravelling 85 rods, surfacing with earth 115 rods, putting in four wood culverts, and making an earth fill of 25 yds. Road No. 2, River Road from Lot 1 west to St. Elmo, four miles of old road improved by grading 320 rods, repairing one 60 ft. timber bridge, and spreading 137 loads of gravel and 35 loads of earth. Road No. 3, Reay Road, from Lot 1 west to Doe Lake, three miles of old road improved by grading 600 rods and spreading 119 loads of gravel and 20 loads of earth on 100 rods. Road No. 4, the Musquash Long Point Road from Gravenhurst to the Townline of Wood Township, five miles of old road repaired, 900 rods sidebrushed, 20 pine stumps blasted out, 200 rods graded, 100 rods surfaced with earth, four wood culverts placed, and one 12 ft. wood bridge repaired. Road No. 5, the Leg Lake Road from Gravenhurst west to Townline of Wood Township, four miles of old road repaired, sidebrushed 480 rods, 10 pine stumps removed, graded 200 rods, surfaced with earth and covered with broken stone, 100 rods, ten wood culverts and 30 yds. rock fill. Road No. 6, the Bracebridge Road from Muskoka River southward, three miles of old road improved by removing ten pine stumps, grading 960 rods, blasting out 20 yds. rock, spreading 28 loads of gravel, and 28 loads broken stone on 30 rods and putting in six wood culverts. Road No. 7, Lakeshore Road, from Tom Stephen's corners, along road Divisions 6 and 5, to the Town of Gravenhurst, four miles of old road repaired, sidebrushed 160 rods, removed 12 pine stumps, graded 400 rods, surfaced 100 rods with earth and gravel, put in three wood culverts, and made an earth fill of 50 yds.

McLean and Ridout By-law No. 371.—Road No. 1, between Concessions 6 and 7, Lots 23 to 21, 1½ miles of new road were cleared, stumped, graded and crowned with gravel, 13 wood culverts placed, and a rock fill of 12 yds.

Orillia By-law No. 906.—Road No. 1, on 2nd Concession, Lots 5 to 9, two miles of old road improved by grading 550 rods, surfacing with gravel 602 rods, putting in one cement culvert and making a stone fill of 126 yds. Road No. 2, on Concession 2, Lots 11 to 18, 520 rods of old road improved by sidebrushing 70 rods, grading 50 rods, and gravelling 520 rods. Road No. 3, Concession 3, Lots 15 to 18, 180 rods of old road covered with gravel, 20 rods being stumped and 30 rods graded and one wood culvert built. Road No. 4, on Concession 4, Lots 2 to 6, 130 rods of old road graded, 560 rods covered with gravel and iron culvert placed. Road No. 5, 4th Concession, Lots 1 to 6, 145 rods of old road graded, and 307 rods covered with gravel. Road No. 6, on the 6th Concession, Lot 1, north to 19, 180 rods of old road graded and covered with broken stone. Road No. 7, Concession 8, Lot 1, north to Lot 10, 370 rods of old road graded. Road No. 8, Concession 8, Lot 14, north to Lot 15, 180 rods of old road graded and 40 rods covered with broken stone. Road No. 9, 9th Concession, Lot 1, north to Lot 18, 395 rods of old road graded, 315 rods surfaced with gravel, one wood and three cement culverts built. Road No. 10, Stanton Road, through Lots 18 and 19, 240 rods of old road improved by sidebrushing 130 rods, stumping 140

rods, grading 240 rods, and placing two cement and two stone culverts. Road No. 11, Concession line 13, Lot 10, north to Lot 12, 125 rods of old road were improved by sidebrushing 8 rods, grading 29 rods, gravelling 125 rods, blasting out 25 yds. of rock and making a stone fill of 70 yds. Road No. 12, Concession line 17, Dalton Road, south to Lake Couchiching, 70 rods of new road were cleared, stumped and graded. Road No. 13, between Lots 5 and 6, across Concession 3, 160 rods of old road were graded and crowned with gravel.

Oro By-law No. 420.—Road No. 1, between Concessions 12 and 13, Lots 2 to 6, 1½ miles of new road opened up, ditched on both sides, stumped and grubbed 320 rods, crowned with earth 480 rods, and built one 14 ft. timber bridge.

Perry By-law No. 124.—Road No. 1, between Concessions 12 and 13, from Lots 12 to 10, thence between Lots 10 and 11, north to 14th Concession, ¾ mile of old road was graded, 200 rods crowned with gravel, 25 rods of stone fill, and three stone culverts built.

St. Edmunds By-law No. 156.—Road No. 1, Bury Road, from 50th sideroad to Townline Lindsay and St. Edmunds, ten miles of old road were improved, 345 rods sidebrushed, 380 rods graded, 500 rods gravelled, 163 yds. rock fill, and a cedar railing for guard.

Stisted By-law No. 200.—Road No. 1, from a point on 3rd Concession, where the sideroad intersects on Lot 16, north, to Concessions 4 and 5, thence west to 10th and 11th sideroads, thence north to blind line 2¼ miles of old road were improved by sidebrushing 200 rods, grading 400 rods, gravelling 175 rods, building two wood culverts and 14 rods of outlet ditches. Road No. 2, commencing on blind line, Lots 28 and 29, Concessions 2 and 3, thence north following Lake Vernon Road to Etwell, 1¾ miles of old road improved, sidebrushing and grading 600 rods, gravelling 360 rods and putting in four wood culverts.

Strong By-law No. 342.—Road No. 1. Between Concessions 10 and 11, Lots 18 to 20, ¼ mile of old road was improved by sidebrushing 50 rods and grading and gravelling 40 rods. Road No. 2. Along the Distress River Road Lots 17 and 18, 80 rods of old road sidebrushed, graded and gravelled. Road No. 3. Between Lots 10 and 11, across Concessions 1 and 2, ¾ mile of old road improved, sidebrushed 90 rods, graded 200 rods, gravelled 50 rods. Road No. 4. Between Lots 30 and 31, across Concession 5, ½ mile of old road improved, sidebrushed 50 rods, graded 150 rods, gravelled 55 rods. Road No. 5. Between Lots 25 and 26, across Concession 11, ½ mile of old road was improved by doing considerable blasting, clearing out sides 75 rods, grading 100 rods, and gravelling 50 rods.

Sundridge By-law No. 211.—Road No. 1. Distress River Road. Lots 20 to 26, 1 mile of old road was graded and gravelled, and 4 tile culverts placed.

Sunnidale By-law No. 431.—Road No. 1. Between Concessions 2 and 3, from Lots 23 to 22. A new steel and concrete bridge, 60 ft. in length was built and the approaches filled with earth and stone 340 yds.

Tay By-law No. 596.—Road No. 1. Between Concessions 1 and 2, Lots 77 to 95, 266 rods of old road graded, 94 rods crowned with gravel, 30 rods with earth and stone fill 200 yds. Road No. 2. Between Lots 80 and 81, and Lots 5 and 6, across Concessions 1 to 5, 434 rods of old road were improved by being graded, 82 rods sidebrushed, 30 rods stumped and 100 rods gravelled. Road No. 3. Running in a north-west direction through Lots 8 to 10, across Concessions 13 and 14, 52 rods of old road covered with gravel, 44 rods graded. Road No. 4. Boundary of Tay and Tiny, Lot 74 north to Lot 112, 370 rods

of old road graded, 69 rods gravelled, and 1 wood culvert placed. Road No. 5. Between Concessions 1 and 2, Lots 1 to 13, 400 rods of old road improved, sidebrushed 160 rods, stumped and grubbed 160 rods, graded 195, gravelled 96 rods, ditched 80 rods, earth fill 20 yds. Road No. 6. Between Concessions 4 and 5, Lots 1 to 13, 100 rods of old road improved, sidebrushed 38 rods, graded 55 rods, gravelled 87 rods, 4 iron culverts placed, earth cut 1,800 yds., and earth fill 1,800 yds. Road No. 7. Between Concessions 5 and 6 from Lots 1 to 13, 80 rods of old road stumped, 132 rods graded and 197 rods crowned with gravel. Road No. 8. Across Concessions 1 and 5, between Lots 80 and 81, 10 and 11, 150 rods of old road improved, graded 127 rods, gravelled 85 rods, 1 iron culvert placed, earth cut 1,044 yds., fill 1,044 yds. Road No. 9. Between Concessions 6 and 7, across Lots 1 to 8, 1 mile of old road improved by grading 100 rods, gravelling 300 rods and ditching 60 rods. Road No. 10 Between Concessions 7 and 8, Lots 1 to 8, 230 rods of old road graded and 200 rods crowned with gravel. Road No. 11. Between Concessions 8 and 9, Lots 6 and 7, 110 rods of old road ditched. Road No. 12. Between Concessions 9 and 10, Lots 5 and 6, 120 rods of new road were stumped and 40 rods graded. Road No. 13. Between Concessions 10 and 11, across Lots 9 and 10, 246 rods of old road covered with gravel. Road No. 14. Between Concessions 12 and 13, Lots 13 and 14, ¾ mile of new road opened up, cleared 50 ft. wide, 30 rods graded, earth cut and fill 40 yds. each. Road No. 15. Between Concessions 13 and 14 from Lots 3 to 7, 120 rods of old road graded and 100 rods crowned with gravel. Road No. 15A. Between Concessions 8 and 9 from Lots 1 to 5, 110 rods of new road stumped and grubbed, and 20 rods graded. Road No. 16. Between Concessions 9 and 10 from Lots 1 to 5, 95 rods of old road covered with gravel and 1 iron culvert placed. Road No. 17. Between Lots 5 and 6, across Concession 13, 40 rods of old road crowned with gravel. Road No. 18. Between Concessions 1 and 2, Ordnance Lots 7 to 64, 480 rods of old road graded, 16 rods surfaced with earth, 6 rods ditched and 2 iron culverts placed. Road No. 19. Between Concessions 2 and 3 Ordnance Lots 35 to 68, 378 rods of new road graded, 30 rods cleared 26 ft. wide, 1 iron culvert placed, 123 rods ditched and a stone fill 170 yds. Road No. 20. Between Concessions 4 and 5, Lots 15 and 16, 340 rods of old road were covered with gravel, 40 rods graded and 3 concrete culverts placed. Road No. 21. From the Penetanguishene Road, Lots 100 and 101 east to the 2nd Concession, thence south to Mud Lake on 2nd Concession Road, 229 rods of old road graded, 82 rods covered with broken stone and 41 rods gravelled. Road No. 22. Boundary between Tay and Medonte, Concession 1, east to Concession 13, 167 rods of old road were graded and 74 rods crowned with gravel. Road No. 23. Boundary of Tay and Matchedash, from Lot 1 north to Lot A, 36 rods of old road were gravelled and 1 wood culvert placed.

Tiny By-law No. 522.—Road No. 1. Between Concessions 2 and 3 opposite Lot 13, 75 rods of old road graded, one 50 ft. new bridge built on cedar piles with steel girder and 5 in. cedar covering, earth cut 1,500 yds., fill 1,755 yds. Road No. 2. Between Concessions 1 and 2, opposite Lot 90 of original survey, 25 rods of old road graded and 1 new 50 ft. bridge resting on cedar piles with steel girder and 4 in. plank covering, earth fill 450 yds.

EAST DIVISION.

Addington and Harlowe Road.—Lots 31 and 32, Concession 3, Barrie, 1½ miles of old road were improved by filling in 45 rods of a swale with stone, side-brushing 320 rods, grading 75 rods, gravelling 210 rods, ditching 300 rods and putting in 4 stone culverts.

Admaston Township Roads.—Whalen Settlement Road, Lot 6, Concession 7, to Lot 8, Concession 5. Three-quarters of a mile of old road was improved by grading 240 rods and covering it with loam, blasting out stone, side-draining and building 1 cedar culvert. Shamrock and Quilty Road, Lot 6, Concession 11, to Lot 4, Concession 11, ¼ mile of old road improved by cutting down a bad hill, removing stone from same, grading up and side-draining the road. Renfrew and Admaston Road. Lots 8 and 7, and Concession 1, ¼ mile of old road improved by grading 80 rods and surfacing with gravel 80 rods. McDougal Road, Lots 30 and 31, Concession 9, ¼ mile of old road graded. Pucker Street Road, Lots 4 to 6, Concession 2, ¾ mile of old road improved by removing stone, surfacing with earth and covering with corduroy and gravel.

Airy Township Roads.—Saline to Whitney from Lot 58, Concession 2, to Lot 18, Concession 1, One-half mile of road improved by grading 100 rods, surfacing with earth 64 rods, covering corduroy and building 4 wood culverts. Between Concessions 4 and 5, Lots 19 to 22, ¾ mile of old road improved by clearing stone from road, grading 80 rods, surfacing with earth 45 rods and putting in 1 wood culvert. Between Concessions 2 and 3, from Lots 10 to 16, 1½ miles of old road improved by removing boulders and draining, sidebrushed 40 rods, graded 160 rods, crowned with earth 40 rods, and 3 wood culverts. Between Concessions 4 and 5 from Lot 19 to Lot 7, 3 miles of old road improved by grading, draining and covering corduroy, 400 rods graded, 88 rods crowned with earth and 4 wood culverts. Hay Lake Road, Lots 1 and 2, Concession 2, ½ mile of new road was cleared, stumped, graded and levelled through woods and 1 wood culvert built.

Alice, 10th Concession.—Lots 13 and 14, Concession 10. Three-quarters mile of old road improved by cutting down hill, brushing out the road and building 3 cedar culverts, graded and crowned with loam, 240 rods. Lot 11, Concession 10, 100 rods of old road improved by replacing 2 cedar culverts with steel pipe, cutting down hill and gravelling 80 rods; another steel culvert was lengthened and a fill widened thus requiring 30 rods to be crowned with clay and gravel.

Anson and Hinden Township Roads.—Thirteen miles of old road in this Township improved by putting in 4 cedar and 1 iron culverts, repairing a 20 ft. bridge at Lot 5, on the Bobcaygeon Road and filling in the ravine.

Anstruther Township Roads.—Between Lots 36 and 37, Concessions 2, 3, 4, 230 rods of old road graded 16 ft. wide.

Appleby Road.—Between Lots 4 and 5, across Concessions 2 and 3. Three hundred rods of road improved by being graded and ditched, 2 wood culverts placed.

Appleby and Hagar Boundary.—Lots 1 to 5, two miles of new road opened up by being brushed out, stumped, stoned and grubbed and placing 4 wood culverts.

Arden and Parham Road.—Kennebec Township, 6 miles of old road improved by sidebrushing 300 rods, grading 50 rods and putting in 10 concrete culverts.

Ardoch and Clarendon Road.—From Lot 6, north-east Range to Lot 3, Concession 2, Clarendon, 342 rods of new road opened up by being cleared, stumped and grubbed, 600 ft. corduroy covered with earth and gravel.

Alice Road.—Lots 11 and 12, Concession 6. One-half mile of old road was graded and surfaced with loam, rock blasted out, stones removed and corduroy covered with gravel.

Bancroft and Hermon Road.—Across Lots 18 and 19, Concession 11, Dungannon. One-half mile of old road was improved by blasting out rock and stones, sidebrushing, grading and ditching 140 rods, 3 stone culverts.

Bancroft and Coe Hill Road.—Between Lots 8 and 9, across Con. 3. Faraday. One-half mile of old road improved by blasting out rock, removing stumps and boulders, and making a good sub-soil grade, 40 rods sidebrushed, 160 rods graded and 2 cedar culverts built.

Bangor, Wicklow and McClure Township Roads.—Across Lot 9, Concession 10, McClure, 40 rods of old road improved by building a new steel bridge having a span of 13 ft. and grading. Across Lots 13, 14, 15, Concession 3, Wicklow. One-half mile of old road was improved by blasting out large boulders and clearing the side, 80 rods graded and 2 cedar culverts built.

Bath Main Road.—Near boundary of Ernestown, 166 rods of old road graded and surfaced with broken stone, also ditched on both sides.

Battersea and Keelerville Road.—From Lot 9, Concession 10, to Lot 14, Concession 11, Storrington. Two miles of old road improved by grading 500 rods, gravelling 640 rods and placing 4 tile culverts.

Beachburg Road.—Lots 8 to 10, Concession 2. One mile of old road graded and surfaced with gravel. Lots 2 to 4, Concession 3, ¾ mile of old road graded and surfaced with gravel. Lots 16 to 24, Concession 2, Pembroke Township, 800 rods of old road graded and surfaced with gravel and 80 rods ditched.

Beckwith, 9th Line.—Lots 6 and 8, on Concession 9. One-half mile of old road improved, 80 rods sidebrushed and 150 rods crowned with gravel 12 ft. wide. This was a long narrow road through a swamp and was widened out.

Bedford Mills Road.—Lot 1, Concession 6, North Crosby, 80 rods of old road graded and surfaced with broken stone.

Bedford and Opinicon Road.—Lots 3 and 4, Concession 16, to C. N. R. Station, Bedford. One and a half miles of a waggon trail was made into a good road by cutting down 2 hills, blasting out stone, sidebrushing 300 rods, grading 325 rods, surfacing with earth 200 rods and building 5 stone culverts.

Bedford and Opinicon Road.—Lots 5 to 8, Concession 16, from C. N. R. North, Bedford. Two and a half miles of old road improved by sidebrushing 450 rods, grading 235 rods, surfacing with earth 400 rods, and building 5 cedar culverts.

Bellamy Road.—Lots 26 to 24, Concession 8, Pakenham. Three-quarters mile of old road graded and surfaced with loam, and one 15 ft. cedar bridge built.

Belmont Township Roads.—Cordova Road between Concessions 3 and 4, across Lots 14 to 12, 127 rods of old road improved by taking out large stone, grading and gravelling. Stoney Lake Road, Lots 22 to 24, Concession 9, 84 rods of old road gravelled and large boulders removed. Round Lake Road, Lot 23, Concession 8, 89 rods of old road surfaced with crushed stone.

Bells' Rapids Road in Bangor.—Lot 16, Concession 9, 200 rods of old road sidebrushed and graded, a large quantity of boulders and considerable blasting of rock performed to give drainage, 3 cedar culverts built.

Bessimer and Herman Road.—Lot 10, Concession 8 and Lot 11, Concession 9, Mayo. One-half mile of old road improved by being graded and gravelled, boulders and stumps blasted out and 3 cedar culverts built.

Bessimer and Long Lake Road.—Across Lots 13 and 14, Concession 8, Mayo. 120 rods of old road improved by grading, crowning with gravel, sidebrushing, blasting out boulders and pine stumps, putting in 1 cedar culvert and building one 18 ft. cedar bridge.

Bexley Township Roads.—Across Lots 34 and 35 Gull River range. Fifty rods of old road graded and crowned with hand broken stone.

Bigwood.—Concession 5, Lots 2 to 4. One mile of new road cleared and graded 24 ft. wide and 2 wood culverts built.

Black Creek Road.—Lots 24 to 26, Concession 22, North Algona. Three-quarters mile of old road was graded and surfaced with earth. Lots 25 and 26, Concession 17, Wilberforce, 120 rods of old road graded and surfaced with loam.

Black River Road, Dalton.—Between Concessions 11 and 12, on Lots 18 and 19. Three and a half miles of old road improved by taking out large stumps from the centre of the road, grading in several places, 600 rods surfaced with gravel, and 4 stone culverts built. From Lots 21 to 29, Concession 12, 3 miles of old road improved by removing several pine stumps, grading 720 rods, surfacing with earth 600 rods, putting in 5 stone culverts and repairing one 16 ft. bridge.

Bagot and Blythefield Township Roads.—Lanark and Calabogie Road, Lots 15 and 16, Concession 9, Bagot. One-half mile of old road was graded and surfaced with gravel. Lot 29, Concession 4, Bagot, 80 rods of old road graded and surfaced with loam and 40 rods of new road graded and surfaced with loam to avoid a bad hill. Burnstown and Springtown Road, from Lot 17, Concession 2, to Lot 12, Concession 6, Bagot. Three-quarters mile of old road repaired by improving several hills, graded and surfaced with loam 200 rods, and 1 cedar culvert placed. Warren Road, Lots 30 to 32, Concession 3, Bagot. Three-quarters mile of old road improved by removing a quantity of stone and grading and surfacing 240 rods with loam. McHugh Settlement Road, Lots 3 to 5, Concession 2, Bagot. One-half mile of old road improved by removing stone, brushing out, grading 80 rods and gravelling 160 rods. McNabb and Bagot Townline, Lot 6, Concession 1, to Lot 7, Concession 1, Bagot, 80 rods graded and surfaced with loam, 2 cedar culverts built and several boulders removed. Calabogie and Lanark, on Concession 9, across Lot 4. One-half mile of old road improved by removing stones, grading and surfacing 160 rods. Ashdad and Calabogie Road, on Concession 2, from Lots 5 to 7, 240 rods of old road graded and surfaced with loam and 2 cedar culverts built.

Bonfield Township Roads.—Lots 35 to 32, Concession 2, 126 rods of old road sidebrushed, 80 rods graded, 221 rods ditched and 2 wood culverts built. Lot 27, Concession 2, west to Lot 20, Concession 3. One and a half miles of old road improved by blasting rock on heavy hill, removing boulders, making a stone cut 24 yds. and grading 37 rods. Lot 29, Concession 4, 111 rods of old road ditched through muck and clay soil and 29 rods sidebrushed. From Lot 5 to Lot 2, between Lots 10 and 11, ¾ mile of old road improved by blasting rock and draining, grading 80 rods, gravelling 90 rods and putting in 1 wood culvert. Concession 2, 120 rods of old road graded, 20 rods crowned with earth, one stone culvert placed and clay hills cut down and ravines filled in. Lots 35 to 33, Concession 8, 160 rods of old road sidebrushed and graded, 20

rods crowned with earth, 3 wood culverts placed, one heavy hill cut down which required some blasting. Fifteenth sideroad, Concessions 9 and 10, 1 mile of road improved by clearing 80 rods, stumping and grubbing 10 rods, grading 120 rods, and putting in 1 wood culvert. Fifteenth sideroad, Concessions 6 and 7, ½ mile, being a deviation around a hill, was graded and 30 rods surfaced with earth. From Lot 10, Concession 6, west to Lot 4, Concession 5, 200 rods of old road graded, 2 wood culverts placed and boulders removed.

Booth Road to Cache Bay.—To Concession 2, Field, 1,320 rods of road graded and surfaced with earth, 1 mile being cleared, stumped and grubbed, and 2 stone culverts built.

Boulter Township Roads.—Lot 11, Concession 3, North-west to Lot 12, Concession 4, ½ mile of old road improved by doing some blasting, sidebrushing and grading 80 rods, crowning with earth 15 rods, and building 4 wood culverts. Lot 10, Concession 18, east to Lot 11, Concession 18, 132 rods graded and ditched, and 4 wood culverts placed. Between Lots 25 and 26, Concessions 12 and 11, 220 rods of new road cleared, stumped and grubbed through a very heavy grade.

Bromley Township Roads.—Lot 22, Concession 8, ½ mile of old road improved by putting in a new 60 ft. cedar bridge, grading down a bad hill 40 rods and surfacing 40 rods with stone and loam.

Bromley and Westmeath Townline.—Lots 25 and 26, Bromley, to Lots 7 and 8, Westmeath. One-half mile of old swamp road improved by being raised 2 ft. with stone and gravel, 1 wood culvert was placed.

Bronson Fill, York Branch.—Lot 24, Concession 11, Dungannon Township. This work consisted of building a breakwater by filling in with stone, to prevent the road from being washed away along the river bank, 60 ft. long, 12 ft. deep and 8 ft. wide.

Brougham Township Roads.—Kennelly Mountain on Lot 4, Concession 3. One hundred rods of old road improved by removing stone, grading and covering with gravel. Maloney Mountain between Concessions 11 and 12, Lot 3. One-quarter mile of old road on a long mountain improved by removing stone, sidedraining, grading 80 rods and surfacing 80 rods with stone. Mount St. Patrick Road. From Lot 2, Concession 14 to Lot 1, Concession 11, one mile of old road graded and surfaced with loam and 2 cedar culverts built.

Brudenell and Lyndock Township Roads.—From Lots 24 to 26, Concession 16, Lyndock. Three-quarters mile of of old road improved by removing stone, grading and surfacing with loam, 240 rods, and building 2 cedar culverts. Killaloe and Rochefort Road from Lot 4, Concession 1, to Lot 6, Range A., Hagarty, 160 rods of old road graded and surfaced with loam and 2 culverts repaired. From Lot 291 S. B. R. to Lot 295, S. B. R. south Bonnechere range, 16th Concession, Brudenell. One mile of road improved by grading, sidedraining and spreading gravel on low places. Rockingham and Quadville Road. Lots 24 to 27, Concession 15, Brudenell, 320 rods of old road graded and surfaced with earth, 3 cedar culverts built and boulders removed.

Buckhorn Road.—Lot 14, Concession 9, Harvey, 23 rods of old road improved by building a stone bridge 50 ft. in length with cedar post for railing, 20 rods gravelled. Between Concessions 7 and 8, Lots 25 to 28, Harvey, 86 rods of old road covered with broken stone. From Lots 21 to 24, Concession 8, Harvey, 75 rods of old road gravelled and covered with broken stone. Lot 20, Concession

8, Harvey, 32 rods of old road improved by being gravelled and then covered with broken stone, some boulders were removed.

Burgess Mines Road in Carlow.—On Concession 13, on Lots 7 to 10. Two hundred rods graded and drained, stumps and stones removed and 3 cedar culverts built.

Burleigh Township Roads.—On Concession 6, Lots 9 to 12, 459 rods of old road graded and covered with crushed stone.

Bromley and Admaston Townline.—Lots 4 and 5, Concession 1. One-half mile of old road improved by grading a clay road 40 ft. wide, covering 16 ft. in centre with gravel.

Bromley Townline.—Lot 6, Concession 1. One-half mile of old road improved by cutting down a rocky hill and building approaches to new bridge, 80 rods graded and covered with rock and loam.

Burwash Road.—Lot 11, Concession 3. One mile of new road cleared, 240 rods graded, 2 wood culverts and one 32 ft. wood bridge built.

Calvin Township Roads.—Between Lots 10 and 11, across Concessions 3 and 4. One mile of old road removed by grading, levelling and removing stone, graded 40 rods, crowned with gravel 23 rods, and put in 4 wood culverts. Concession 8, Lots 16 to 18, 50 rods cleared and crowned with gravel, rock blasted out and road widened. Between Lots 23 and 24, Concession 4, and west between Concessions 3 and 4, across Lot 24, ½ mile of new road was cleared, stumped and graded, 3 wood and 1 stone culverts placed and ½ mile of old road graded. Concession 2, on 15th sideroad, 180 rods of old road graded, 30 rods sidebrushed and 2 wood culverts put in. From line between Lots 30 and 31, west on boundary to Lot 35, ¾ mile of old road was widened and drain made through a muck swamp, graded 45 rods, surfaced with earth 35 rods, ditched 54 rods and 1 culvert built.

Caldwell and Badgerow Boundary.—Lots 8 to 12. One-half mile of old road improved by removing stones, grading and surfacing with earth and placing 2 wood culverts.

Cameron Township Roads.—Between Lots 30 and 31, 200 rods of new road cleared, stumped, graded and levelled and 1 wood culvert built. Twenty-fifth sideroad, across Lot 1, 80 rods of old road were cleared by removing stones, sidebrushing and grading, putting in 1 wood culvert. Twenty-fourth sideroad, Lots 7 and 8, ½ mile of old road improved by rebuilding a 30 ft. wood bridge, stumping and grading 4 rods, surfacing with earth 7 rods. Lot 1, on boundary of Lot 2, Concession 5, 80 rods of a heavy hill graded and drained, also sidebrushed. Cameron and Papineau Boundary, Lots 1 to 5, 63 rods cleared and graded through heavy clay soil and one heavy hill cut.

Carden, Concession 1, Lots 17 and 18.—Sixty-seven rods of old road gravelled.

Carden, Concession 5, Lots 16 to 24.—One hundred rods of old road graded and gravelled and 1 cedar culvert placed.

Carden, Concession 8, Lots 10 to 13.—Two miles of old road improved by grading and gravelling 65 rods, putting in 1 cedar culvert and filling in several low places with stone and earth.

Cardiff Township Roads.—From Lot 26, Concession 17, to Hastings Boundary. One and one-half miles of road improved by taking out large stones, resurfacing with soil, cleaning out side-ditches, cutting brush on each side of the road and putting in 3 wood culverts. Station Road, Concession 12, 80 rods graded and 1 stone culvert placed.

Cavendish Township Roads.—White Lake and Gooderham Road, Lots 3 to 21, Concession 18, 189 rods of old road improved, 180 rods graded, 1 wood culvert placed, 1 wood crossing 103 ft. long and 1 stone crossway 6 rods long, 12 ft. wide, 2 ft. high. Gooderham Road, Lots 12 and 13, Concession 3, 124 rods of road improved, 100 rods graded and a wood crossing 4½ rods in length built.

Chandos Township Roads.—Concession 16, Lots 25 to 27. One hundred and twenty rods on the Coe Hill Road crowned with earth through a long swamp. Scott Road west, between Concessions 11 and 12, Lots 4 to 9. Two hundred and thirty-four rods of old road crowned with earth. Between Concessions 2 and 3, Lots 18 to 27. Two miles on the East Road improved by removing large stones, grading 54 rods and crowning with earth 185 rods, Concession 13, Lots 30 to 31. One hundred and eighty rods on Scott Road east crowned with earth. Between Concessions 10 and 11, Lots 19 to 21. Two hundred and thirty-four rods of old road well improved by grading 180 rods and surfacing the corduroy with earth 54 rods.

Charlestown Lake Road.—From the boundary of Athens and Yonge to Lot 15, Concession 8, Yonge. Three-quarters of a mile of old road improved, 165 rods graded, 300 rods ditched and 77 cords of stone piled for crusher.

Chisholm Township Roads.—Between Lots 20 and 21, Concessions 5 to 7, 240 rods of new road cleared through heavy timber and 160 rods stumped and grubbed. Between Concessions 12 and 13, Lots 3 to 5, ¾ mile of old road improved by grading, draining and gravelling low land, graded 160 rods, gravelled 60 rods, and 3 wood culverts placed. Between Lots 20 and 21, across Concessions 5 and 6, ½ mile of new road through a swamp graded and surfaced with earth. Between Lots 5 and 6 through Concessions 3 and 4, 240 rods cleared through heavy hardwood bush, 160 rods stumped and 29 rods graded. Between Lots 5 and 6, across Concession 5, ½ mile of new road through green standing timber cleared, stumped and grubbed, 30 rods graded, 12 rods corduroyed and 2 wood culverts built. Between Lots 20 and 21, through Concessions 13, 14, 15, ¾ mile of old road improved by sidebrushing 60 rods, grading 96 rods and surfacing 36 rods of corduroy with earth.

Chisholm, Ferris and North Bay Road.—Between Lots 19 and 20, across Concessions 5 to 7, mile of old road improved by grading, draining and crowning through swamp land, grading 140 rods, crowned with gravel 40 rods. Between Lots 19 and 20, Concession 2, Ferris, 80 rods of old road graded, culvert placed and a little blasting on 3 heavy hills. Between Lots 19 and 20, Concession 4, 1¾ miles of old road improved by grading hills and covering corduroy, graded 160 rods, surfaced with earth 63 rods.

Cobden and Eganville Road.—From Lot 17 to 8, Concession 8, Wilberforce, one mile of old road graded, 160 rods surfaced with loam, boulders removed and 40 rods of clay soil surfaced with gravel.

Constance Creek Road.—Lot 5, Concession 5, to Lot 6, Concession 6, Tarbolton, 1 mile of old road improved by raising a swamp road, approaches to bridge, repairing railing on bridge and painting the whole structure and covering corduroy with gravel, graded 320 rods, surfaced with loam and gravel 210 rods.

Cosby, from North Boundary between Lots 5 and 6.—Across Concessions 5 and 6, 2 miles of new road cleared 30 ft. wide, 80 rods graded and 1 wood culvert placed.

Cosby, between Concessions 1 and 2, across Lots 2 and 3, and between Lots 2 and 3, across Concession 1.—Three-quarters of a mile of old road graded and

¼ mile of new road opened up, ditched and graded, 2 wood culverts and one 18 ft. wooden bridge.

Cross Lake and Madawaska Road.—Lot 16, Concession 2, south to Lot 17, Concession 1, Lyell, ¾ mile of old road improved by clearing, removing stones, grading 161 rods, surfacing 15 rods with earth and draining, 2 wood culverts built. Lot 9, Concession 12, Lyell, north to Lot 14, Concession 1, Murchison. Five miles of old road improved by removing boulders, crowning, grading and draining, graded 480 rods, crowned with earth 80 rods and 4 wood culverts placed.

Cosby, between Lots 6 and 7, across Concessions 1, 2, 3.—One mile of new road cleared, 160 rods stumped, 80 rods of outlet ditches and 4 wood culverts built. Part II, Cosby, across Concession 3, 1 mile of new road cleared, 160 rods graded, 50 rods of outlet ditch and one culvert placed.

Cassimer and Jennings Road.—Between Concessions 2 and 3, Lot 12, Cassimer, and Lot 1, Jennings, ¼ mile of new road cleared, graded and 1 mile of old road graded and 5 wood culverts built.

Dalhousie, between Concessions 1 and 2, across Lot 7.—A long cedar bridge was shortened up and approaches built to it, 40 rods being graded and surfaced with gravel.

Dalton, Concession 1, Lots 15 to 17.—One mile of old road was graded and surfaced with gravel and 1 cedar culvert built.

Dalton, along Concession 11, Lot 25, and ending Concession 12, Lot 25.—One and one-half miles of old road improved by spreading earth on solid rock and breaking stone on low places.

Dead Creek Road.—Lot 9, Concession 6, North Crosby, 40 rods of old road graded and covered with stone.

Deseronto to Bogart Road, Hungerford.—Lot 24, Concession 4, ¾ mile of old road improved by resurfacing with gravel and opening up drains, 80 rods graded and 2 metal culverts placed. Lengthwise of Lot 23, Concession 2, then across Lot 22, Concession 4, 1½ miles of old road improved by sidebrushing 160 rods, recrowning with gravel 400 rods and putting in 1 stone culvert.

Douglas Station Road, Lots 1 and 2, Concession 9, Bromley.—One mile of old road graded and gravelled and 1 stone culvert.

Douro Township Roads.—Telephone Road, Lot 18, Concession 4, 16 rods of old road gravelled, 1 cement and 1 wood culverts put in and one 25 ft. stone bridge built. Telephone Road between Lots 15 and 16, across Concessions 2, 3, 98 rods covered with gravel.

Dummer Township Roads.—Ninth line, Lot 22 to 28, 264 rods crowned with gravel.

Dungannon and Monteagle Boundary.—One-half mile of old road improved by removing stumps and boulders, grading 160 rods and building 3 cedar culverts.

Dungannon, Concession 2, Lot 21.—A large culvert was built to avoid a gulley bridge, under a fill of pine logs, a good railing was put on each side, one side of the fill walled with stone, graded 8 rods.

Dunnett, between Lots 2 and 3, across Concessions 2, 3, 4.—One and one-half miles of old road graded and 5 wood culverts placed.

Douglas Road to Church.—One-quarter mile of stone road built, 80 rods graded and crowned with broken stone.

Eganville and Killaloe Road.—From Lot 27, Concession 5, to Lot 26, Concession 8, South Algona, 2 miles of old road improved by grading and surfacing with loam and building a new bridge, 34 ft. span, cedar stringers and culverts.

Eldon and Carden Boundary, between Victoria Road and Trent Canal.—One mile of old road was improved by taking out old corduroy and putting in broken stone, grading 120 rods and surfacing same with broken stone.

Faraday and Herschel Townline, across Lots 9 and 10, Concession 16.—One hundred and twenty rods old road graded and widened by clearing out the sides, blasting out rock and removing boulders and putting in 2 cedar culverts.

Faulkner, Concession 5, from Lot 11 west.—Three-quarters of a mile of new road graded, ½ mile being cleared 30 ft. wide and 2 wood culverts built.

Ferris Township Roads.—Lots 40 and 41, across Concession 18, 70 rods of new road cleared, stumped and graded. North Bay and Bonfield Road from Lot 32, Concession 15, west to Lot 36, Concession 16, ¾ mile of old road improved by removing stone and boulders, brushing out the road, grading 240 rods and placing 2 wood culverts. Between Concessions 4 and 5, Lot 15, 140 rods underbrushed and 80 rods cleared through woods. Between Lots 14 and 15, across Concessions 11 and 12, 1 mile of new road was opened up by clearing 300 rods, stumping 240 rods, grading 10 rods, building 1 wood culvert and 1 20 ft. timber bridge on south branch of Lavasse Creek. Between Lots 29 and 30, across Concession 14, 200 rods of old road cleared and 60 rods of new road cleared, 32 rods stumped and 34 rods graded. Between Lots 9 and 10, across Concession 4, 45 rods of old road over a heavy clay hill with many boulders cleared and graded. On Concession 2, Lot 18, 72 rods of old road graded and 2 new wood culverts placed. On Concession 4, Lot 10, 20 rods of old road sidebrushed and 18 rods graded, blasted out several boulders and rocks. Between Lots 14 and 15, across Concessions 9 and 10, 200 rods of old road improved by clearing brush and logs 60 rods, grading 160 rods, removing stone and building 3 wood culverts. From Lot 19, Concession 13, to Lot 29, Concession 14, ½-mile of old road improved by blasting out boulders, sidebrushing 20 rods, grading 160 rods and building 1 wood culvert. Across Lots 7 and 8, Concession 2, ½ mile of old road improved by sidebrushing 80 rods, grading 160 rods and putting in 2 wood culverts. From Lots 34 to 27, Concession 11, ½ mile of old road improved by sidebrushing 80 rods, stumping 40 rods, ditching 80 rods, surfacing with earth 80 rods and building 2 wood culverts. Across Lot 26, on Concession 1, 56 rods of new road cleared through a beaver meadow, 20 rods being ditched.

Field, Larocque Road, between Concessions 5 and 6.—Three-quarters of a mile of old road graded and ½ mile of old road cleared 30 ft. wide.

Field, Grant Road, between Concessions 1 and 2, Lots 4 to 8.—Two miles of new road cleared, stumped and grubbed and 6 wood bridges, 3 having a span of 12 ft. and 3 of 30 ft. were built.

Field, between Lots 10 and 11, Concessions 6 to 1, Badgerow.—Three-quarters of a mile of new road opened up 20 ft. wide, 160 rods stumped and grubbed, 500 ft. of corduroy and 5 wood culverts.

Fifth Depot Lake Road.—Across Lot 13, Concession 12, Hinchinbrooke, 200 rods of old road cleared 10 ft. on each side, 150 rods graded and crowned with earth and 3 cedar culverts placed.

Folger Road.—Lots 36 to 33, Concession 3, Palmerston, 82 rods of old road graded and covered with earth and 3 cedar culverts built, ½ mile of new road opened up by clearing, ditching and surfacing with earth 71 rods and grading 99 rods.

Fort Stewart and Craigmont Road.—Across Lot 25, Concession 14, Carlow, ¼ mile of new road opened up to avoid a steep hill, 80 rods being cleared, 90 rods graded and 5 cedar culverts placed.

Frontenac and Leeds Townline Deviation.—Along the Boundary of Pittsburg and Leeds, from Lot 38, Concession 10, in Leeds, to part 2 in Pittsburg, 15 rods of old road graded, 115 rods covered with broken stone.

Fraser, 10th Concession, opposite Lot 4.—One-half mile of old road improved by building a 17 ft. cedar bridge and constructing approaches to it, also grading and surfacing with loam 80 rods.

Foymont Road.—Between Lots 4 and 5, across Concession 14, Sebastopol, ½ mile of old road improved by cutting down a hill, removing large stones, grading up hill and side draining the road, 160 rods graded, 160 rods covered with loam and 2 cedar culverts built.

Galway Township Roads.—Monck Road, Lots 13 and 14, Concession 18, 150 rods old road graded and one bad hill repaired. Kinmount Road, Lots 10 and 12, Concession A, 146 rods of old road graded and 50 rods covered with gravel. Jackson Road, between Concessions 16 and 17, from Lot 30, 200 rods of old road brushed on each side and graded 16 ft. wide. Allen Line Road, between Concessions 11 and 12, from Lot 10, 150 rods of old road graded.

Glamorgan Township Roads.—The Monck and Buckhorn Road; on the Monck Road from Lots 26 to 35, between Concessions 5 and 6, 3 miles, and on the Buckhorn Road from the boundary of Cavendish to the 3rd Concession, 2½ miles, and from 10th Concession, Glamorgan, to the Boundary of Dysart, 4½ miles, 10 miles of old road improved by patching the low places with stone and earth, hauling earth on rocks, cleaning out side ditches and repairing old culverts.

Golden Lake and Round Lake Road.—On Concession 4, across Lot 3, North Algona, 160 rods of old road graded and surfaced with loam from Lot 3, Concession 1, North Algona, to Lot 36, Concession 13, Wilberforce, ¾ mile of old road graded and surfaced with loam and 2 cedar culverts built. On Concession 14, across Lots 32 and 33, North Algona, ¾ mile of old road improved by removing stone, grading 340 rods and surfacing 240 rods with loam.

Grant Road, Lots 11 and 12, Concession 4, and South.—One and one-half miles of old road repaired by brushing out and grading, and 2 miles of new road cleared.

Grattan Township Roads.—Concession 14, across Lot 4, ½ mile of old road repaired by removing stone, grading and surfacing with loam. On Concession 4, across Lot 6, 40 rods of new road built around Dick Hill, graded and surfaced with stone, 1 cedar culvert built. Across Lot 25, on Concession 20, 80 rods of old road graded and 40 rods of corduroy surfaced with loam. Across Lot 5, on Concession 16, ½ mile of old road improved by removing stone, grading and surfacing with loam 150 rods and covering corduroy with gravel. From Lot 20, Concession 16, to Lot 16, Concession 21, 160 rods of old road graded and surfaced with loam. From Lot 30, Concession 16, to Lot 31, Concession 18, cut down one gravel hill, covered corduroy with gravel and gravelled 40 rods. Across Lot 15, Concession 6, ¼ mile of old road improved by removing stone and surfacing 80 rods with gravel. Across Lot 10, Concession 16, 80 rods graded and surfaced with loam and a 20 ft. cedar bridge built.

Griffith Township Roads.—From Lots 28 to 30, Concession 4, one mile of old road put in good repair by grading and surfacing 320 rods. Lots 21 to 31, Con-

cession 4, ½ mile of new road opened up to avoid hills and 480 rods of old road covered with stone and loam, 3 cedar culverts and one 30 ft. cedar bridge built.

Griffith Road.—Across Lot 32, Concession 6, ½ mile of old road through a low swamp drained and raised by grading and surfacing with loam 160 rods.

Haddo and Loudon Boundary.—Concession 6, to Concession 4, 2 miles of new road opened up, ½ mile cleared 50 ft., ¾ mile stumped and grubbed and 2 miles graded, 50 yds. of outlet ditch.

Harvey Township Roads.—Deer Bay Road, 100 rods of old road sidebrushed, 90 rods graded and gravelled and large boulders removed. Lot 13, Concession 9, 60 rods of old road covered with gravel and broken stone. Concession 13, across Lot 7, 75 rods of old road covered with gravel. Between Lots 20 and 21, across Concession 13, 87 rods of old road crowned with gravel and 1 stone bridge 200 ft. in length, including railing of wood, was constructed.

Hagarty, Richards and Burns Township Roads.—Lots 29 and 30, on proving line between Concessions 4 and 5, 80 rods of old road graded and covered with stone and loam, a bad hill cut down, sidedrained and stone removed. Between Lots 15 and 16, across Concession 4, 120 rods of new road graded and surfaced with loam. From Lot 10, Concession 7, to Lot 11, Concession 8, 40 rods of new road cleared, stumped and grubbed through a swamp, corduroyed and covered with gravel. Lot 8, Concession 6, to Lot 9, Concession 6, ½ mile of old road improved by being graded and surfaced with loam and removing a lot of stone from the roadbed. On the 4th Concession, across Lot 16, 160 rods of old road graded and surfaced with loam and 1 very bad stone hill repaired. Concession 6, across Lot 4, ½ mile of old road surfaced with gravel to cover an old corduroy. Lot 5, Concession 4, to Lot 6, Concession 6, 160 rods of gravel and loam spread on a long swamp corduroy.

Hastings Road, Maynooth to Bancroft.—Eighty rods of old road graded. 20 rods of ditch blasted through solid rock and broken stone spread on the road and 4 cedar culverts built.

Hastings Road, south of Bancroft.—Eighty rods of old road repaired by making a large fill, blasting out a number of large pine stumps, sidebrushing and grading 80 rods.

Hastings Road, north of Maynooth.—One 12 ft. square cedar bridge built and raised 3 ft. between 2 hills, filling and grading the hills on each side, large boulders and rock blasted out, 64 rods graded and 1 cedar culvert built.

Hastings Road, north of Ormsby.—Forty rods sidebrushed, 80 rods graded, 5 cedar culverts built, some ditching and a large number of stumps and boulders removed.

Head, Clara and Maria Township Roads.—Twenty-fifth sideroad, 60 rods cleared and 80 rods graded, one 20 ft. wood bridge built on Deux Rivières Creek. From Lots 25 to 23, on 8th Concession, ¾ mile of old road improved by removing stone and building one 38 ft. wooden bridge. Lot 26, Range A, on the Stonecliffe Road, 80 rods of old road improved by brushing, taking out stone, crowning with gravel and putting in 1 stone culvert. Mattawan and Pembroke Road, from Lot 1A B. Range west, to Lot 8A B. Range, 10 rods of old road graded and the bridges on Harvey and Colter Creeks recovered. In front of Lot 17, Concession 8, one 27 ft. cedar bridge and approaches filled and crowned with gravel.

Howe Island Road.—Between Lots 5 and 6, 61 rods of old road graded and covered with broken stone, 7 stone culverts placed and a stone fill 7 rods long and 2 ft. deep. Lot 27 to Ferry, 76 rods of old road graded and 81 rods crowned with stone.

Hugel Township Roads.—Lots 11 to 8, Concession 2, 1½ miles of new road stumped and grubbed and 4 wood culverts placed. Hugel and Badgerow Boundary, Concessions 8 to 4, ½ mile of old road graded and ditched, 80 rods of corduroy placed and 2 wood culverts built. Both Concessions 2 and 3, Lots 2 and 3, ½ mile of old road sidebrushed and graded, 70 yds. of corduroy and 7 wood culverts placed, improving 1 mile of road.

Hungerford Township Roads.—Across Lots 7 and 8, Concession 4; (2) across Lots 2 and 3, Concession 7; (3) across Lots 34 to 37, Concession 6, 2 miles of old road were improved by sidebrushing 240 rods, grading 400 rods and gravelling 640 rods.

Hungerford and Tyendinaga Boundary, across Lot 8.—Eighty rods of old road graded and gravelled.

Hungerford and Sheffield Boundary.—Lots 38 and 39, 40 rods of old road improved by cutting down a very steep and rough hill, cleared and graded 40 rods, and a stone fill of 200 yds.

Huntingdon Swamp on 12th Concession.—Eighty rods of old road improved by filling across swamp with broken stone 6 in. deep and covering with a good crown of gravel, 40 rods sidebrushed, 80 rods graded, 40 rods covered with broken stone and gravel and 3 cedar culverts built.

Hastings and Addington Boundary.—Lot 1, Concession 1, Sheffield, 40 rods of old road graded and gravelled and 100 yds. stone fill.

Hickey Settlement Road.—Lots 42 to 43, Concession 9, Herschel, 80 rods of new road made around a steep hill, cleared 80 rods and graded 80 rods.

Hybla Station Road from Bartlett's store.—Across Lots 10 to 13, Concession 8, Monteagle, 200 rods of old road graded, 4 cedar culverts put in and one 32 ft. cedar bridge repaired.

Irving Schoolhouse Road.—Lots 9 and 10, Concession 29, Range B, Alice, 40 rods of old road improved by brushing out the sides and raising it, grading and surfacing with loam 40 rods. Lot 27, Concession 10, Alice, ¼ mile of old road improved by cutting down a clay hill, removing stone, grading and surfacing with clay and stone 80 rods.

Jones' Falls and Crosby Road.—On Concession 5, Lot 10, North Crosby, 67 rods of old road crowned with gravel.

Kaladar, Anglesea and Effingham Road.—Three hundred and forty rods of old road improved by filling 46 rods with stone, blasting for ditching, cutting down hills, putting in 2 stone and 3 wood culverts.

Kingston and Perth Road.—Across Lot 25, Concession 8, North Crosby, 35 rods of old road improved by blasting out 6 yds. of rock, cutting down a hill about 4 ft., removing 6 large pine stumps, grading 25 rods and gravelling 35 rods. Lot 10, Concession 7, North Crosby, 80 rods of old road graded and surfaced with earth.

Kirkfield and Dalrymple Road.—Lots 11 and 12, Carden, 330 rods of old road crowned with gravel.

Kirkpatrick, between Concessions 2 and 3, across Lots 3 and 4.—Two hundred and forty rods of old road graded and 5 wood culverts placed

Kirkpatrick, Piquitte Road, between Lots 7 and 8, south.—One hundred and forty rods of old road graded and gravelled and 2 wood culverts built.

L'Amable and Fort Stewart Road.—Lots 12 and 13, Concession 13, Mayo, ¾ mile of old road improved by removing a large quantity of stone and grading 240 rods of a long hill, also building 3 cedar culverts.

Lanark, 10th line.—Lot 3, 40 rods of old road graded and gravelled and a long corduroy repaired by putting in 100 yds. of cedar, building approaches and covering with gravel.

Lanark and Darling Townline.—On Concession 4, from Lot 27 to 25, Darling, ¾ mile of old road graded and surfaced with loam

Lanark and Mississippi Road.—From Lot 16, Concession 3, North Sherbrooke to the boundary of Lanark and Addington, 150 rods of old road improved by grading 96 rods, gravelling 100 rods and ditching 40 rods.

Lavant, 8th Concession—Lots 6 to 11, 1½ miles of old road graded and surfaced with loam, considerable stone was removed and sidedraining done. One cedar bridge was repaired.

Lavant, White Lake Road.—From Lot 13, Concession 8, to Lot 14, Concession 8, 240 rods of old road graded and surfaced with loam and one cedar culvert placed.

Laxton, Digby and Longford.—Monck Road, between Lots 6 and 7, Concession 7, to between Lots 5 and 6, Concession 8, Laxton, one low place filled in with stone and 90 rods covered with gravel, one stone culvert placed. Between Lots 8 and 9, at centre of Concession 7, Laxton, 80 rods of old road graded and surfaced with gravel and soil, several large boulders were blasted out. Lot 9, rear of Concession 4, Laxton, 78 rods of old road improved by gravelling 48 rods, putting 2 ft. broken stone on 30 rods of bridge and covering it with gravel in order to prevent water washing over in the spring. Concession line at front of Concession 4, to the rear of Concession 6, Laxton, 200 rods of old road graded 100 rods surfaced with gravel and approaches to old bridge at each side of the crossing were filled in with stone. Lots 27 to 25, Concession 2, Digby, 160 rods of old road graded and 170 rods crowned with gravel. Lots 32 and 33, Concession 3, Digby, 240 rods of old road covered with gravel and the approaches to the bridge on Lot 33 were repaired.

Lower Faraday Road.—Lot 29, Concession 3, Faraday, 80 rods of old road sidebrushed, stumped and boulders removed, and graded, and 3 cedar culverts built.

Lutterworth Township Roads.—The Boundary of Anson to Concession 10, 3 miles of old road improved in several places by grading 320 rods. Boundary of Anson south to Lot 20, 3 miles of old road repaired by patching several bad places with soil and repairing old culverts; 20 rods crowned with earth. From Lots 2 to 6, Concession 1, 160 rods of old road graded and surfaced with earth. South Boundary Anson, Lot 16, Concession 12, one mile of old road repaired by grading 65 rods, putting in 2 cedar culverts and patching several places with earth. From Lot 13, Concession 8, to Lot 27, Concession 3, 3½ miles of old road repaired, the approaches of the bridge over Black Creek were filled, as well as several bad holes, 70 rods crowned with gravel and one cedar culvert placed. Lot 12, Concession 5, to Lot 19, Concession 7, 1¾ miles of old road improved by grading 50 rods, putting in one stone culvert, removing boulders and fixing several places by hauling gravel and soil on the rock.

Lyell Township Roads.—Lot 47, East Range, south to Lot 29, 3 miles of old road improved by cleaning, blasting and removing boulders from road bed, draining through rough hills, sidebrushed 320 rods, graded 487, surfaced with earth 47 rods and putting in 8 wood culverts.

Maberley and Westport Road.—Proving line between Lots 5 and 7, South Sherbrooke, 2 miles of old road graded and surfaced with earth, 1 cedar and 6 concrete culverts placed and large boulders removed.

Madawaska and Hastings Road.—Lot 27, Concession 14, Lyell, north to Lot 18, Concession 1, Murchison, 3 miles of old road improved by blasting out some boulders, grading 320 rods, surfacing with earth 57 rods, putting in 4 wood culverts. From Lot 31, Concession 11, north to Lot 25, Concession 13, Lyell, 2½ miles of old road improved by blasting rock, removing boulders from heavy hills, sidebrushing 121 rods, grading 240 rods, surfacing with gravel 63 rods and building 5 wood culverts.

Mara, between Concessions 4 and 5, Lots 2, 3, 4.—Three-quarters of a mile of old road improved, 92 rods graded and 135 rods surfaced with gravel.

Mara, between Concessions A and L, across Lots 2 and 3.—Three-quarters of a mile of old road improved, graded 70 rods, gravelled 199 rods.

Mara and Carden Boundary.—Across Concessions 5 and 6, 1¼ miles of old road improved, 280 rods graded, 174 rods gravelled, 2 wood culverts placed and 120 rods cleaned out for an outlet from the road ditches.

Martland and Cosby Boundary.—Lot 12, east, between Concessions 5 and 6, 1¼ miles of new road opened up, stones removed and graded. Lots 2 to 5, 1½ miles of old road graded and 2 wood culverts placed and 25 rods of new road cleared and graded.

Martland and Scollard Boundary.—Lots 4 and 5, ½ mile of new road cleared, 80 rods graded and 4 wood culverts built. Lots 9 and 10, 160 rods of new road cleared, stumped and graded and 1 wood culvert placed. Lots 10 to 12, one mile of old road repaired, cleaning out the ditches and making small outlet ditches, grading and putting in 2 wood culverts.

Mason and Scollard Boundary.—One mile of new road stumped, grubbed and ditched and 160 rods graded.

Mattawan Township Roads.—Les Erables Road, Lot 36, Concession 6, graded a very heavy hill, 80 rods. From Lot 33, Concession 4, west to Lot 34, Concession 2, 140 rods of old road improved by removing boulders, side cutting and gravelling. Les Erables Road, Lot 34, Concession 4, to Lot 24, Concession 6, 40 rods of old road sidebrushed and graded. Les Erables Road, Lots 36 to 33, Concession 3, 60 rods of old road sidebrushed and graded and 1 wood culvert placed and some blasting and ditching done. From the boundary on the Les Erables Road north to the 6th Concession and west to Lot 35, Concession 6, ¾ mile of old road improved by clearing 40 rods, grading 80 rods, crowning with gravel 40 rods, and putting in 4 wood culverts.

Mattawa and Pembroke Roads.—In front of Lot 21, Concession 12, Papineau, 80 rods of old road graded. From Lot 10, Concession 14, angling south-west to Lot 18, Concession 13, Papineau, 240 rods of old road graded and 14 rods covered with earth. From Lot 13, Concession 11, north-west to Lot 15, Concession 11, Papineau, 240 rods of road improved by clearing, removing timber, rock and boulders and blasting out rock.

Matawatchan Township Roads.—Lots 10 and 9, Concession 3, McPherson Hill, ¼ mile of old road improved by cutting down a hill and removing stone and levelling up the road. On Concession 5, across Lot 20, 40 rods of a new road built around a bad hill, on the Camel Chute Road, cleared, stumped, graded and surfaced with loam 40 rods. Denbigh Road, Lots 6 to 8, Concession 3, 240 rods of old road graded and surfaced with loam, 2 cedar culverts built. Feland Hill, Lots 15 to 17, Concessions 16, 240 rods of old road graded and surfaced with loam, hill cut down and stone removed.

Methuen Township Roads.—Vansickle Road, Lot 3, Concessions 1 and 2, 174 rods of old road graded and 7 rods covered with broken stone. Lots 11 and 12, Concession 3, 200 rods of old road improved and boulders and stone removed. Lots 8 to 9, Concession 4, 54 rods of old road improved by stoning and crowning with earth two long hills, crowned with earth 54 rods, with broken stone 20 rods.

Minden Township Roads.—Gelert Road from Minden, one mile of old road improved by patching several places with gravel, 60 rods crowned with gravel. Carnarvon to Dysart, Lots 21 to 25, Concession 13, 250 rods of old road cleared and 1 cedar culvert placed. From Alsaw to Dysart, Lot 25, Concession 6, to Lot 32, Concession 10, 3½ miles of old road repaired by cleaning out ditches, removing stone, filling in 4 places with stone about 1 ft. deep and 14 ft. wide, blasted out a few large boulders and gravelled 20 rods.

Mississippi Road.—Lot 1, Concession 9, to Lot 6, Concession 15, Veranchers, 36 rods of old road graded, 5 cedar culverts built 7 hills cut down and filled in at bottom and considerable stone blasted out.

Mississippi and Lanark Boundary.—Lot 16, Concession 3, North Sherbrooke, to Lot 8, Concession 10, Palmerston, 210 rods of old road improved, graded 186 rods, surfaced with gravel 210 rods, ditched 300 rods, and 8 cedar culverts built.

Monck Road, Lot 4 to Uphill.—Between Concessions 1 and 2, Dalton, 340 rods of old road graded, 320 rods gravelled, and 1 cedar culvert built.

Monck Road, South on J. Thurston's Quarterline.—Concession 2, Dalton 200 rods of old road graded and gravelled and a 60 ft. approach to the bridge over Head River covered with stone and gravel to a depth of 2 feet.

Monck Road, from 4th Quarterline to Johnston's Corners.—Lot 18, Concession 2, Dalton, 100 rods of old road graded and gravelled.

Monmouth Township Roads.—Between Concessions 11 and 12, across Lots 23 to 25, one mile of old road graded, large stones and stumps removed, and the road straightened. From Lot 15, on the Boundary of Anstruther, across Lots 15 and 16, Concessions 1 and 2, across Lots 16, 21, 22, two miles of South Monmouth Road improved by hauling soil on the rock, breaking stone in low and soft places, and building 2 stone culverts.

Montague Road.—From Lots 21 to 23, Concession 9, Montague, ¾ mile on the Swamp Road graded and surfaced with gravel.

Moxam Settlement Road.—Lots 25 and 26, Monteagle, 240 rods of old road graded, 80 rods gravelled, and 4 cedar culverts placed.

Mud Lake Road.—From Lot 5, Concession 6, to Lot 8, Concession 6, Wilberforce, 1½ miles of old road improved by covering a swamp road with gravel, removing stone from road bed, sidedraining, grading 400 rods, surfacing with loam 250 rods, repairing 1 bridge and building 3 stone culverts.

Musclow's, Schoolhouse Road.—Lot 14, Concession 3, and lengthwise of Lot 15, Concession 2, Monteagle, 200 rods of old road improved by clearing off the sides, removing all obstructions by blasting, grading 200 rods, and putting in 2 cedar culverts.

McGregor Hill, in Bangor.—Lot 10, Concession 4, 120 rods of old road improved by blasting out rock and boulders, sidebrushing 120 rods, grading 120 rods, putting in 4 cedar culverts and building 2 cedar bridges, one 14 ft. and the other 18 ft. span.

McLean Road, in Wicklow.—Between Concessions 2 and 3, across Lots 11 and 12, 120 rods of new road opened up, 135 yds. being corduroyed through a swamp, 120 rods cleared, stumped and graded, 1 cedar culvert built.

McPherson, between Concessions 1 and 2.—Lots 6 to 10, 1 mile of new road was stumped, grubbed and graded, 9 culverts were built.

Mount St. Patrick and Douglas Road.—Half mile of a very rough piece of road was improved by removing large stones, grading and gravelling 160 rods, and putting in 1 cedar culvert.

Mount St. Patrick and Black Donald Mine Road.—Lots 11 and 12, Concession 7, Brougham, ½ mile of old road graded and surfaced with loam and 3 cedar culverts built.

Madawaska River Road.—Lots 21 and 22, Concession 4, Griffith, 40 rods of old road improved by repairing one cedar bridge and grading and surfacing 40 rods with loam and putting in 1 cedar culvert.

North Algona Township Roads.—Lots 18 and 19, Concession 1, one mile of old road improved by blasting stone out of the road bed, grading and surfacing 240 rods with loam and building one 18-ft. cedar bridge. Lots 5 to 7, Concession 20, 240 rods old road graded and surfaced with loam and 3 cedar culverts placed. Lots 31 to 33, Concession 20, 240 rods graded and crowned with loam and 1 cedar culvert built.

New Boyne Road.—A pile of stone 446 in. high, 44 ft. long, and 24 ft. wide was hauled and piled on Concession 3, lot 7, Bastard, for stone crusher.

North Bay and Trout Lake Road.—Lots 20 to 23, Concession 17, Ferris, 164 rods of old road cleared, graded and ditched, and 4 wood culverts placed.

North Bay to Trout Lake, South Shore.—From Lot 17, Concession 16, southeast to Lot 15, Concession 15, Ferris, 109 rods of old road sidebrushed, 270 rods graded and boulders removed, and 7 wood culverts placed.

Oso New Road.—Lot 13, Concession 1, Oso, 57 rods of stone fill made and covered with gravel.

Pakenham and Kinburn Road.—Lots 10 and 11, Concession 12, Pakenham. 240 rods of old road graded and crowned with loam and gravel.

Papineau Township Roads.—Lots 30 and 32, Concession 15, 240 rods of old road graded and 9 rods crowned with earth. Between Lots 15 and 16, Concessions 10 and 11, 121 rods of old road cleared, brushed and graded and considerable blasting done. In front of Lot 35, Concession 12, 6 rods of old road graded 14 ft. wide, considerable rock blasted out, 5 yards of stone fill and 1 wooden bridge 10 ft. span with stone abutments was built. Lot 11, Concession 11, north to Lot 10, Concession 13, ¼ mile of old road improved by crowning 50 rods with gravel and making a stone and earth fill of 20 rods. Lots 11 and 12, Concession 12, 80 rods of old road improved by removing boulders, grading and draining, and 21 rods crowned with earth. Between Lots 5 and 6, Concession 9, and east to Lot 4, Concession 8, ¾ mile of old road improved, 20 rods cleared 40 ft. wide, 20 rods graded and ditched, 40 rods crowned with earth, and 2 stone and 4 wood culverts placed. Lot 10, Concession 9, to Lot 11, Concession 8, ¾ mile of old road improved by grading 160 rods and crowning 80 rods with earth. Lots 27 to 24, Concession 15, 160 rods of old road improved by grading and crowning with earth 80 rods. Lots 27 to 30, Concession 15, ¾ mile old road graded. Calvin and Papineau Boundary, Lot 35. Half mile of old road improved by clearing 100 rods, blasting out considerable rock and stumps, and crowning 115 rods with gravel.

Papineau, 10th Concession.—Lots 24 and 25, ½ mile of old road improved by grading 57 rods through heavy clay soil. Lots 9 to 11, 220 rods old road graded

and making 300 yds. fill at Boom Creek. Lot 15, Concession 11, ½ mile of old road improved by removing boulders, grading 120 rods, and crowning 80 rods with earth.

Pembroke Road.—Between Lots 5 and 6, Concession 1, and Lots 3 and 4, Concession 2, one mile of old road improved, 320 rods graded and crowned with loam, and two cedar culverts built.

Pembroke and Eganville Road.—Lots 27 to 29, Concession 1, Alice, one mile of old road improved by grading and crowning with gravel and placing three corrugated steel culverts. Lots 12 to 16, Concession 21, Wilberforce, 1¾ mile of old road improved by removing stone, grading and crowning 560 rods with loam.

Perch Lake Road.—Lots 11 and 12, Concession A, Faraday, ½ mile of old road improved by clearing 60 rods, removing large stone and sidebrushing, grading 120 rods, and building one wood culvert.

Perth Road, Bedford.—Lot 25, Concession 8, to Lot 21, Concession 7, 1¼ miles of old road improved, graded 405 rods, crowned with gravel 395 rods, seven tile culverts placed and considerable ditch deepened.

Peterson Road, Maynooth to Combermere.—Half mile of old road improved by clearing and grading 120 rods, removing large boulders and pine stumps, and building one wood culvert.

Petewawa Township Roads.—Lot 15, Concessions 3 and 4, to Lot 16, Concession 2, 1½ miles of old road graded and crowned with loam through a very rough country, one cedar culvert built. Lots 21 to 23, Concession 5, 400 rods of old road graded and crowned with loam.

Pigeon Creek Road.—Lot 1, Concession 5, Ennismore, 61 rods of old road crowned with gravel. Lot 8, Concessions 6 and 7, 73 rods of old road graded and crowned with gravel.

Plevna to Lavant Station.—Lots 38 and 39, Concessions 3 and 4, Clarendon, 250 rods new road cleared, underbrushed and graded, 80 rods crowned with gravel, 27 rods corduroy laid, and three stone and three cedar culverts built.

Portland and Loughboro' Boundary, Concession 4.—One hundred and forty-seven rods of old road crowned with broken stone.

Perry Road from Dag's Landing.—Barrie Township, six miles of road repaired by taking out stone, filling bad places, crowning 80 rods with broken stone, and repairing three corduroy bridges 12 ft. span.

Perrault Settlement Road.—From Lot 20, Concession 16, to Lot 16, Concession 21, Grattan, 160 rods of old road graded and surfaced with loam and stone.

Radcliffe Township Roads.—From Lot 28, Concession 4, to Lot 30, Concession 5, one mile of old road repaired by grading 320 rods, surfacing with loam 320 rods, putting in four cedar culverts, repairing a cedar bridge, and covering some corduroy with gravel. Barry's Bay Road, Lot 17, Concession 12, 160 rods of old road was graded and surfaced with loam and a few boulders blasted out. Lot 8 to 20, between Concessions 9 and 10, 320 rods of old road were graded and surfaced with loam, two cedar culverts built, stones removed and stumps blasted out. Rockingham and Wilno Road, Lot 225, North Opeongo, one mile of old road was graded and surfaced with loam, one 16 ft. cedar bridge built, and boulders removed from the road.

Raglan Township Roads.—Little Ireland Road, Lot 8, Concession 6, to Lot 9, Concession 7, 80 rods of new road cleared, stumped, graded and surfaced with

loam, and two 20 ft. cedar bridges built. Lots 14 and 15, Concession 15, ½ mile of old road was improved by removing stone, grading 160 rods, crowning with loam 160 rods and side-draining. Lots 29 to 27, Concession 8, 160 rods of old road graded and surfaced with loam, boulders removed and corduroy covered with earth. Lots 16 and 17, Concession 16, 160 rods of old road graded and surfaced with loam, side-drained and stones removed. Lot 35, Concession 17, ¼ mile of new road graded and surfaced with loam and stone, and 100 ft. cedar corduroy bridge built. Lot 12, Concession 1, stringers taken from under 40 rods of corduroy and corduroy dropped down into sand and covered with gravel.

Ramsay, 7th Line.—From Lot 15, Concession 7, to Lot 17, Concession 7, one mile of road which was opened last year graded and surfaced with gravel.

Rama Road, from Lot 24, North.—Half mile of old road improved by repairing ruts, grading 120 rods, and surfacing with broken stone 140 rods, in another place 60 rods graded and 70 rods crowned with broken stone.

Rama Road, between Old and New Surveys, Concessions C to G.—Two miles of old road improved by covering a swamp road 160 rods in length, grading 120 rods on higher ground, and sidebrushing 240 rods. Between Concessions F and G, 266 rods of gravel spread on sandy portion of the road.

Rama and Morrison Townline.—Opposite Lots 2 and 3, 9, and 10, 14 and 15, 1½ miles of old road covered with gravel and 160 rods graded.

Richmond and Tyendinaga Boundary, Lennox.—Lot 1, Concession 9, 230 rods of old road covered with gravel and one wood culvert placed.

Richmond and Tyendinaga Boundary, East Hastings.—Lengthwise lot 40 N. Range, Concession 3, 160 rods of old road graded and gravelled.

Rolph, Buchanan and Wylie Township Roads.—Lot 11, Concession 13, to Lot 1, Concession 8, 2½ miles of old road improved by grading and surfacing with loam 130 rods, putting in one cedar culvert and spreading gravel on long corduroy. From Lot 40, Range B, to Lot 46, Range A, one mile of old road graded and gravelled and three cedar culverts built.

Rose Hill Road.—Lot 1, Concession 9, to Lot 8, between 6th and 7th Concessions, Denbigh, two miles of old road improved by taking out stone, underbrushing 380 rods, and grading 640 rods.

Ross Township Roads.—Lots 9 and 10, Concession 1, ¾ mile of new road cut out, stumped, grubbed and graded, and 80 rods surfaced with gravel and two cedar culverts built; some corduroy covered with gravel.

Ryan Road, from Peterson Road, to New Carlow.—Lot 3, Concession 1, Wicklow, to Lot 1, Concession 15, Monteagle, 80 rods of old road cleared, graded, 1 cedar culvert and one cedar bridge built, twelve rods of corduroy and some ditching.

Sebastopol Township Roads.—Lots 19 to 21, Concession 5, 640 rods of old road graded and surfaced with loam, and outlet ditches provided. Lots 41 and 42 S.P.S., 320 rods of old road graded and covered with loam, boulders removed, two culverts built and several repaired. Lot 11, Concession 12, to Lot 30, Range C., 320 rods of road graded and gravelled, stones removed from road, and 5 cedar culverts built.

Second Quarter line, between 9th Concession, Victoria Road, Carden.—Three hundred and forty rods of old road covered with broken stone.

Scully and Graphite Mine Road.—Lots 25 and 27, Concession 4, Bagot, 160 rods of new road stumped, graded and surfaced with loam and two culverts built.

Sherbourne Township Roads.—Lot 2, Concession 4, to Lot 2, Concession 5, five miles of old road were improved by building culverts, filling in low places,

and removing stone and other obstructions. Lots 4 to 10, Concession 12, 1½ miles old road repaired by cleaning side-ditches, filling in low places with loam and stone, grading 15 rods, gravelling 30 rods, and building one wood culvert.

Sherwood Township Roads.—Wilno Road, Lots 3 and 4, Concession 2, 160 rods of old road graded and gravelled. Lots 17 to 14, Concession 4, 160 rods of old road graded, surfaced with loam and boulders removed. Lot 16, Concession 14, 320 rods graded and surfaced with gravel and loam, boulders removed and some side-draining done. Lots 16 to 18, Concession 4, 240 rods graded and covered with loam and stone. Lots 7 and 8, Concession 4, 160 rods graded, crowned with loam and boulders removed. Lot 29, Concessions 10 and 11, 80 rods of old road improved by cutting down Wilno Hill and putting a cedar culvert at the foot of the hill, 80 rods being graded and covered with gravel and stone. Lot 10, Concession 6, to Lot 12, Concession 10, eighty rods graded and surfaced with loam, two cedar culverts built, and some corduroy covered with earth.

Sherbrooke Road.—Lot 13, Concession 6, North Crosby, seven rods of stone fill covered with 15 in. of gravel and one hill cut down 3 ft. for a distance of 20 ft.

Silver Lake Road.—Lot 20, Concession 5, to Lot 22, Concession 6, South Algona, 160 rods graded and gravelled and 1 wood culvert placed. Lots 25, 26, Concession 5, North Algona, 160 rods of old road gravelled and a new 20 ft. cedar bridge built.

Smith, between Concessions 14 *and* 15, *from Main Road East to Wharf on Clear Lake.*—One hundred and forty-four rods of old road improved by building a stone bridge, two rods in length, grading 142 rods, and gravelling 42 rods.

Smokey Falls Road.—Springer Township, 2¾ miles of old road improved by grading 640 rods, surfacing with gravel 240 rods, and putting in four wood culverts.

Snow Road.—Lot 16, Concession 9, Palmerston, 213 rods of new road cleared, stumped, graded and surfaced with broken stone.

Snowdon Township Roads.—Lot 10, Concession 9, to Lot 11, Concession 12, 1½ miles of old road improved in several places by filling, removing large boulders, and gravelling 80 rods. Lot 5, Concession 14, to Lot 10, Concession 13, 1½ miles of old road improved by patching several bad places with gravel, 40 rods graded, and 100 rods gravelled. Boundary of Anson, to Concession 10, 320 rods of old road graded thus improving several places for about three miles.

Snowdon, Bacon Line, from Monck Road.—Two and one-half miles of old road cleared, stumped, and grubbed 20 rods, graded 500 rods, crowned with earth 80 rods, and placing two wood culverts.

Somerville Township Roads.—Lots 10 to 15, Concession 13, 80 rods crowned with gravel. Lots 49 to 55, 200 rods crowned with gravel and one stone culvert placed and general repairs made for 1¼ miles. Lot 1, Concessions 5 and 6, ¼ mile of old road improved by blasting out rock, grading down hill 60 rods, filling at the bottom with stone and gravel. Between Lots 36 and 37, on Burnt River Road, 200 rods crowned with stone and one cement culvert placed. From Lot 5, Concession 1, across four lots to Bobcaygeon Road, 1½ miles of old road improved by taking out large stones, filling several places with stone, breaking the stone on top and covering with soil.

South Algona, Concession 8.—Lots 6 and 7, Concession 8, 160 rods graded and surfaced with loam and ditched on one side, in front of Lot 7, and 160 rods graded and surfaced with loam in front of Lot 6.

South Algona and Sebastopol Townline.—Lots 20 to 23, Concession 1, 320 rods graded and covered with loam, some blasting was done.

Stafford Road.—Lots 32 to 34, Concession 1, 320 rods graded and surfaced with loam.

Stafford Township, Lot 20, *Concession* 1.—Forty rods of rocky hill blasted out, graded and surfaced with rock.

Storrington Boundary, 9th Concession, Loughboro'.—Lots 26 to 22, 57 yds. of stone fill covered with gravel.

Stanhope Township Roads.—Across Lots 15 and 16, between Concessions 5 and 6, 120 rods of old road improved by grading 50 rods, gravelling 30 rods, resurfacing with earth 40 rods, and putting in one wood culvert. Lot 6, Concession 1, to Concession 3, Bushkoug Bridge, two miles of old road was improved by grading 200 rods and filling in several low places. Lots 15 to 21, along the Bobcaygeon Road, 240 rods repaired by filling in bad places with stone and earth. Lot 15, Concession 2, to Lot 16, Concession 1, 250 rods improved by grading 100 rods, filling several bad places and constructing side ditches. Lots 26 to 31, Concession 1, one mile of old road was improved by grading 200 rods, gravelling 60 rods, putting in two cedar culverts, filling in low places and cleaning out ditches.

Tamworth and California Road.—Lots 8 and 9, Concession 12, Sheffield, 478 rods of old road improved, 106 rods side-brushed 15 ft., 126 rods graded, 310 rods surfaced with earth, and 50 rods with gravel and stone, 200 rods ditched, and three stone culverts placed.

Tamworth and Marlbank Road.—Lot 8, Concession 3, Sheffield, five hills cut down from 2 to 5 ft. and filled in at the bottom, a 130 ft. railing was put in one fill, 260 rods graded and crowned with earth.

Vanleek Settlement Road, in Faraday.—Lots 2 and 3, Concession 1, ¼ mile of old road was improved by grading up two hills and placing a railing on a very dangerous sidehill road overhanging the lake, side-brushed and graded 80 rods, three culverts built.

Victoria Road, from Lot 15, *North.*—Lots 15 to 17, Concession 10, Carden, 140 rods of old road graded and gravelled.

Westmeath, Proving Line, from Concession 1 *to* 2.—Two hundred and forty rods were graded and gravelled, 40 rods cleared, and one cedar culvert built.

White Lake and Darling Road.—Lots 15 and 16, Concession 9, Darling, 320 rods graded and surfaced with earth.

White Lake Road.—Lots 26 to 24, Concession 5, Pakenham, 240 rods old road graded and crowned with earth, stone removed and gravel spread.

Widdifield Township Roads.—Lot 20, Concessions 1 and 2, one mile of old road improved by brushing sides, removing boulders, 200 rods cleared, 40 rods graded and 20 rods gravelled. Lots 19 to 20, Concession B, 200 rods of gravel was spread on a soft road. Lots 16 and 17, Concession 1, north, to Concession 2, two miles of old road improved by removing large stones, gravelling 160 rods through a swamp and side-brushing 240 rods. Between Lots 22 and 23, Concession B, to between Lots 20 and 21, Concession B, ¼ mile of old road improved by blasting rock to open a drain on Larocque's Hill 100 ft. in length, and crowning 40 rods with gravel. Lot 8, Concession B, south-west to Lot 2,

Concession B, a hill cut down, 10 rods cleared, 20 rods graded and surfaced with earth. Lot 8, Concession 1, Clay hill cut down and 80 rods surfaced with earth. Between Lots 14 and 15, across Concession 2, brush cleaned out and stone removed on 160 rods of old road and gravel spread on 140 rods. Across Lots 9 to 6, between Concessions 3 and 4, ¾ mile of old road improved, cleared 20 rods, stumped 10 rods, graded and gravelled 20 rods, and one 16 ft. wooden bridge erected. Between Lots 14 and 15, across Concession 2, one mile of old road was improved by grading and gravelling a swamp road, cleared 80 rods 12 ft. wide, ditched 10 rods, gravelled 140 rods and two wood culverts placed. Lot 10, Concession B, ½ mile of old road was improved by stumping 40 rods, grading 107 rods, and building one wood culvert. Lot 1, Concession 2, to Concession 2, 200 rods of old road side-brushed, 20 rods graded, and one 20 ft. bridge erected. Lot 20, Concessions C, E, D, this old road was improved by doing 30 rods of grading.

Wilberforce, 14th Concession.—Lots 12 to 14, ½ mile of old road was improved by clearing, grading and grubbing 80 rods 40 ft. wide and grading and surfacing 160 rods with earth.

Wilberforce, Concession 12.—Lots 13 to 15, 240 rods graded and surfaced with loam and three concrete culverts placed. From Lots 11 to 13, 240 rods of old road graded and surfaced with earth and three concrete tile culverts placed.

Wilberforce Townline.—Lots 21 to 19, Concession 24, one mile of old road improved by removing large boulders, including general repairs, 320 rods graded and surfaced with earth. Lots 30 to 28, Concession 20, ¾ mile old road improved by blasting out some stones, grading and surfacing 240 rods with earth and building one cedar bridge.

Wilberforce Township Roads.—From Lot 7, Lake Dore Road, to Lot 4, Concession 16, 240 rods old road graded and surfaced with clay and sand and one concrete culvert placed. Lot 1, Concession 5, to Lot 2, Concession 21, 240 rods old road graded and covered with gravel and two cedar culverts put in. Lots 1 to 2, Concession 1, 240 rods of old road graded and surfaced with gravel.

Wollaston and Limerick Road.—Lengthwise of Lot 39, Concession 8, Wollaston, and of Lot 39, Concession 8, Limerick, 240 rods of new road through a swamp opened up to avoid two large hills, and was only put in shape for winter road; 240 rods cleared, stumped and grubbed, 80 rods graded, and 2 cedar culverts built.

EAST DIVISION.

By-laws.

Admaston By-law No. 204.—Road No. 1. Between Lots 8 and 9, Concessions 1 and 2. Three-quarter miles of old road repaired by grading 240 rods, gravelling 80 rods and putting in 1 60 ft. corrugated iron culvert with concrete wing walls at each end.

Adolphustown By-law No. 67A.—Road No. 5. Third Concession on line between east and west, ½ Lot 20, east to south Fredericksburg. One mile old road improved, graded 265 rods, surfaced with broken stone 365 rods, 2 cement and 2 galvanized iron culverts placed and one 18 ft. concrete bridge with cement top and railing built.

Bath By-law No. 2.—Road No. 5. The road running north through Village of Bath to point of intersection with Village of Ernestown. One half mile of old road improved by grading 155 rods and surfacing it with broken stone and digging 312 rods of ditch.

Bedford By-law No. 1B.—Road No. 1. From the line between Lots 25 and 26 north about 3 miles, 108 rods of new road stumped, graded and surfaced with gravel, 4 tile culverts placed and 86 rods ditched. On another part of this road 146 rods stumped, graded and crowned with broken stone. Road No. 2. On Lot 21, between 7th and 8th Concessions, running across Lots 20 and 19, thence easterly to Lot 18, 10th Concession, 286 rods of old road was graded and 215 rods gravelled, 6 concrete culverts placed. Road No. 3. Lot 21, Concession 8, south-west to Lot 6, on 20th Concession, 332 rods of old road graded, 124 rods gravelled, 450 rods ditched and 4 concrete culverts placed.

Belmont and Methuen By-lay No. 545.—Road No. 1. The boundary of Belmont and Marmora from Lot 28 north to the townline, 175 rods of old road improved by surfacing with broken stone 22 rods and with gravel 175 rods. Road No. 2. On the 9th Concession line from Lots 3 to 6, 210 rods graded and surfaced with crushed stone. Road No. 3. On the 7th Concession from Lot 1 north to Lot 6, 260 rods of old road surfaced with gravel. Road No. 4. Between Lots 15 and 16, across Concessions 7 and 8, 163 rods of old road graded and surfaced with earth. Road No. 5. The 11th Concession from Lot 2 north to Lot 9, 151 rods old road graded and 157 rods gravelled. Road No. 6. Between Lots 5 and 6 west from centre of 1st Concession to 2nd Concession, 118 rods of road covered with gravel.

Bexley By-law No. 438.—Road No. 1 Lakeshore Road, Lot 27 to 32. Three miles of old road improved by filling in several places with soil and gravel, removing boulders, grading 360 rods and gravelling 400 rods. Road No. 2. On the baseline Concessions 2 to 5. Two miles of old road improved by crowning with gravel 450 rods, straightening the road at Concession 4, and filling in the low places with stone and gravel. Road No. 3. Bexley and Laxton boundary, Concessions 7 to 9. One and a quarter miles of old road repaired, 30 rods graded, 200 rods gravelled, boulders removed and trees and underbrush cut from each side of the road.

Caldwell By-law No. 185.—Road No. 1. On the line between Concessions B and C, from Lot 8 to McPherson, 2 miles of old road were side-brushed and 50 rods graded, one wood culvert placed. Road No. 2. On the line between Concessions B and A, from Springer to McPherson, 3 miles of old road repaired, 190 rods graded, 4 wood culverts placed and ¼ mile of new road opened out. Road No. 3, on the line between Concessions A and 1 from Lot 8 to McPherson, and from Springer to Lot 5, 240 rods of old road side-brushed, 40 rods graded, 88 rods surfaced with gravel, 210 rods ditched and 3 wood culverts built. Road No. 4, on the line between Concessions 1 and 2, from Springer to Kirkpatrick, 480 rods of old road side-brushed, 240 rods graded, 260 rods gravelled, 2 wood culverts placed. Road No. 5, on line between Concessions 2 and 3, Lot 8, to Kirkpatrick, 1½ miles of old road repaired, one mile sidebrushed, graded 133 rods, gravelled 25 rods and 2 culverts placed. Road No. 6, on the line between Concessions 3 and 4, south of the Veuve River from Lot C to Kirkpatrick, 3 miles of old road were repaired, 127 rods being graded. Road No. 7, on line between Concessions 3 and 4, north to Veuve River from Springer to Kirkpatrick, 5½ miles of old road repaired, 40 rods graded, 320 rods gravelled, 2 wood culverts built and one wood bridge repaired. Road No. 8, on line between Township Springer and Caldwell, Concessions 2 to 4, one mile of old road repaired, 55 rods being gravelled. Road No. 9, across Concessions A and L, between Lots 2 and 3, 200 rods of old road graded, 3 wood culverts placed and 42 rods new road opened up. Road

No. 10, across Concessions A and 1, between Lots 4 and 5, ½ mile of old road repaired, 51 rods being graded and 39 rods gravelled. Road No. 11, across Concessions A and I, between Lots 6 and 7, 2 miles of old road repaired, 180 rods graded, one wood culvert placed and one timber bridge repaired. Road No. 12, between Lots 8 and 9, across Concessions B, A, L, 2, 3, 4 miles of old road repaired, 175 rods graded, 280 rods gravelled, 2 wood culverts placed and one 16 ft. timber bridge built. Road No. 13, across Concessions 4, 5, 6, between Lots 9 and 10 and 8 and 9, 2 miles of old road repaired, 110 rods graded and 6 wood culverts placed.

Carlow By-law No. 57.—Road No. 1, between Concessions 2 and 3, Lots 17 to 10, 360 rods of new road opened up, 160 rods being cleared and stumped, 360 rods graded and 7 cedar culverts built. Road No. 2, between Concessions 20 and 21, across Lots 7 to 12 inclusive, 520 rods of new road cleared, stumped and graded, 3 cedar culverts placed and one 12 ft. cedar bridge built. Road No. 3, in Lot 19, Concessions 1 and 2, 240 rods of old road graded, 80 rods gravelled and 5 cedar culverts built. Road No. 4, from Armstrong's Bridge on Concession 13, up Armstrong's Hill and along 5th sideroad to 12th Concession, 240 rods of old road graded and 3 cedar culverts placed.

Cassimir, Jennings and Appleby By-law No. 63.—Road No. 1, along north boundary of Cassimir, from Lots 1 to 6, one mile of road stumped. Road No. 2, between Lots 8 and 9, across Concessions 3, Cassimir, ½ mile of old road was graded. Road No. 3, across Concessions 3 and 2, between Lots 4 and 5, Cassimir, ½ mile of old road graded. Road No. 4, between Concessions 4 and 5, Lots 6 to 9, 1½ miles of old road graded. Road No. 5, between Concessions 3 and 4, Lots 5 to 7, Cassimir, one mile of new road brushed out. Road No. 6, from Lots 10 to 12, Concession 6, a sub-soil drain, one mile in length, was made. Road No. 7, from Lot 6 to 11 Concession 6, Cassimir, 2½ miles of old road improved. Road No. 8, between Lots 10 and 11, between Concessions 4 and 3, ½ mile of old road improved. Road No. 9, between Concessions 2 and 3, from Lots 8 to 10, Cassimir, one mile of new road chopped out. Road No. 10, boundary west commencing at Concessions 1 to 6, Cassimir, 6 miles of general repairs made. Jennings Township, from Lots 1 to 3, Concession 3, ¼ mile of new road stumped and graded. Road No. 12, from Lots 1 to 6, Concession 4, Jennings, one mile of old road improved, ¼ mile being ditched. Road No. 13, from Lots 1 to 6, Concession 5, Jennings, 3 miles of general repairs and one culvert built. Road No. 14, Appleby Township, from Lots 1 to 5, Concession 6, ½ mile of new road graded. Road No. 15, from Lots 5 to 8, Concession 5, 1½ miles of general repairs to old road. Road No. 16, from Lots 1 to 10, Concession 3, Appleby, 5 miles of general repairs on old road. Road No. 17, from Lots 5 to 10, Concession 2, 2½ miles of general repairs and one culvert placed. Road No. 18, from Lots 1 to 5, Concession 2, Appleby, 2½ miles of general repairs to old road. Road No. 19, boundary between Appleby and Jennings, 7 miles of old road improved by general repairs.

Chisholm By-law No. 47.—Road No. 1, between Concessions 10 and 11, Lots 5 to 22, 3 miles of old road improved in several places by stumping and grading 8 rods, making a rock fill of 16 yds., putting in one wood culvert and building 2 wood bridges, one having a span of 25 ft., the other a span of 12 ft. Road No. 2, on the 10th sideline across Concession 18, 54 rods of old road graded, 22 ft. timber bridge built and a small stone fill made. Road No. 3, 12th Concession, Lots 6 to 25, 3 miles of old road generally repaired, graded 6 rods and corduroyed 10 rods.

Douro By-law No. DCCLXXX.—Road No. 1, between Concessions 6 and 7, Lots 13 to 15, 51 rods of old road surfaced with gravel. Road No. 2, between Lots 20 and 21, across Concessions 1, 2, 3, 104 rods of old road gravelled. Road No. 3, east through Lot 18, across Concession 4, 25 rods old road surfaced with gravel. Road No. 4, between Concessions 6 and 7, from Lots 9 to 1, 78 rods covered with gravel. Road No. 5, between Lots 15 and 16, 50 rods gravelled. Road No. 6, across Concessions 19 and 11, across Concessions 1, 2, 3, 4, 182 rods graded and 100 rods gravelled. Road No. 7, across Concessions 1, 2, 3, through Lots 9, 10, 11, 48 rods gravelled. Road No. 8, across Concessions 3 and 4, through Lots 1 to 5 and 12, 102 rods covered with gravel. Road No. 9, between Concessions 4 and 5, from Lots 9 to 5, and between Concessions 5 and 6, 133 rods covered with gravel. Road No. 10, across Concessions 5, 6, 7, 8, through Lots 8, 7, 6, 5, 62 rods of old road gravelled. Road No. 11, River Road across Concession 9, in front of Lots 9, 10, 11, 50 rods graded and gravelled. Road No. 13, across Concessions 5, 6, 7, 8, between Lots 10 and 11, 60 rods gravelled. Road No. 14, on the River road, across Concessions 7 and 8, through Lots 12 and 13, 29 rods of old road covered with gravel.

Dummer By-law No. 792.—Road No. 1, between Concessions 5 and 6, Lots 1 to 5, 127 rods old road graded and 24 rods crowned with gravel. Road No. 2, across Concessions 5, between Lots 5 and 6, a cedar covering put on a bridge 16 ft. long and 18 ft. wide, 2 rods covered with gravel. Road No. 3, between Concessions 4 and 5, from Lot 3 to 10, 185 rods graded and 48 rods gravelled. Road No. 4, between Concessions 3 and 4, opposite Lot 3, 32 rods of old road graded 21 ft. wide. Road No. 5, between Concessions 3 and 4, from Lots 20 to 23, 150 rods underbrushed, 72 rods graded and 126 rods surfaced with gravel. Road No. 7, between Concessions 3 and 4, opposite Lots 11 and 12, 18 rods old road graded and 90 rods covered with gravel.

Dungannon By-law No. 84.—Road No. 1, L'Amable Station Road from 5th Concession, south, 160 rods of old road side-brushed and graded and one cedar culvert built. Road No. 2, on the David Anderson Bridge on 2nd sideline and between Lots 25 and 26, Concession A, 40 rods side-brushed and graded and one 20 ft. cedar bridge erected. Road No. 3, Vardy Road, north from previous year's work, 80 rods cleared and graded and 4 cedar culverts placed; considerable blasting through rock for drainage. Road No. 5, between Lots 15 and 16, Concession 9, and L'Amable Creek Bridge, a steel bridge was built over L'Amable Creek, cedar abutments filled with stone, steel covering and cedar approaches on each side, span 40 ft.

Dysart By-law No. 552.—The North Road from Haliburton Cemetery to Stanhope boundary, 18 miles of old road repaired by resurfacing and grading short low places, repairing culverts and cleaning out side-ditches. Road No. 2, new road from Haliburton to West Guilford, 3 miles of new road cleared, stumped and graded, stumping being done with stumping powder. Road No. 3, from Haliburton to Fort Irwin, in Harburn; 10 miles of this old road repaired by surfacing with soil, cleaning side ditches and repairing culverts. Road No. 4, from Haliburton east to Monmouth boundary and the Kennaway Road in Dudley, 14 miles of old road repaired; 12 miles of this road resurfaced with gravel, 2 small culverts repaired and about 2 miles road improved with soil, filled in several low places. Road No. 5, from Haliburton south to Glamorgan boundary, 6 miles of new road improved by resurfacing places with soil and cleaning side ditches. Road No. 6, from Haliburton south-west on South Shore

Road to Minden boundary, 5 miles of old road repaired; the greater part of this road from Donald to South Shore Road was resurfaced with waste material from the chemical works and several low places resurfaced with gravel and soil. Road No. 7, from Haliburton North Shore Road to boundary of Minden, 4 miles of old road improved by resurfacing with a light coat of gravel. Road No. 8, from Gilmore's Corners in Dysart to Eagle Lake River in Guilford, 4 miles of old road resurfaced with soil, several pieces of side-ditches cleaned out and 2 small culverts repaired. Road No. 9, from the Cardiff boundary, in the Township of Harcourt, north to Abey Bros.' Mill, 1½ miles of old road improved, graded 80 rods, crowned with earth 200 rods, ditched 8 rods and 2 wood culverts placed.

Eldon By-law No. 410.—Road No. 1, between Concessions 2 and 3, from Lots 1 to 5, 390 rods of old road improved, low soft places filled in with stone, 110 rods graded, 310 rods gravelled and 4 concrete culverts placed. Road No. 2, between Lots 20 and 21, across Concessions 3 to 8, 354 rods surfaced with gravel. Road No. 3, between Concessions 7 and 8, and Lots 42 and 42 S. P. R., 95 rods crowned with gravel. Road No. 4, across Concessions 4 and 5, between Lots 15 and 16, 408 rods surfaced with gravel. Road No. 5, on the line between Concessions 7 and 8, and from Lots 1 to 5, 110 rods of old road crowned with broken stone.

Elzevir and Grimsthorpe By-law No. 325.—Road No. 1, between Concessions 1 and 2, across Lots 3 and 4, 20 rods graded and gravelled and one cedar culvert built. Road No. 2, between Lots 10 and 11, across Concession 1, 80 rods graded and gravelled and 2 cedar culverts placed. Road No. 3, easterly through Lot 5, across Concessions 6 and 7, 160 rods graded and gravelled. Road No. 4, through Lots 19 and 20, Concession 4, 60 rods graded and gravelled and 2 cedar culverts placed. Road No. 5, through Lots 2 and 3, Concessions 6 and 7, 20 rods graded and gravelled. Road No. 6, Lots 3 and 4, Concession 4, 160 rods graded and gravelled and 8 steel culverts with stone sides placed. Road No. 7, through Lots 14 and 15, Concession 9, 80 rods graded and gravelled and one cedar culvert placed.

Faraday By-law No. 51.—Road No. 1, Faraday and Herschel boundary, across Lots 19 and 20, 40 rods graded and 10 rods surfaced with broken stone; 6 cedar culverts placed. Road No. 2, from the foot of Creighton's Hill, Lot 18, Concession 11, west to Lot 20, 120 rods graded and gravelled and 6 wood culverts built. Road No. 3, between Concessions A and B, from Lots 16 to 17, 160 rods of new road cleared, stumped and graded. Road No. 4, Lots 27 and 28, Concession 2, 40 rods side-brushed and graded and 40 rods of gravel spread on corduroy. Road No. 5, from the sideline between Lots 32 and 33, Concession 8, eastward across Lot 32, 80 rods of new road cleared, stumped and graded; 3 wood culverts built.

Front of Yonge By-law No. 50.—Road No. 1, from the G. T. Ry. crossing on main road leading from Brockville to Kingston, 200 rods graded and surfaced with broken stone.

Harvey By-law No. 327.—Road No. 1, Bay Road, Concession 5, Lots 11 and 12, 108 rods crowned with earth. Road No. 2, between Lots 14 and 15, across Concession 4, 150 rods of old road graded and large stones removed and one 12 ft. cedar bridge with stone abutment erected. Buckhorn Road, Lot 16, Concession 9, 46 rods surfaced with gravel and 11 of it covered with broken stone. Road No. 4, between Lots 20 and 21, across Concessions 11 and 12, 72 rods surfaced with gravel. Road No. 5, bridge on Concession 14, between Lots 22 and

23, one 16 ft. stone bridge built and 14 rods old road graded. Road No. 6, between Concessions 9 and 10, opposite Lots 8 and 9, 190 rods new road cleared, stumped and grubbed 18 ft. wide and 50 rods graded. Road No. 7, between Lots 20 and 21, Concession 13, 53 rods of old road crowned with gravel.

Hinchinbrooke By-law No. 7.—Road No. 1, Frontenac Road from Lot 1, Concession 3, north to the Olden boundary on Concession 4, 2 miles of old road improved, graded and surfaced with gravel 283 rods, ditched 400 rods and put in 4 tile culverts. Arden and Parham boundary, from Lot 26, Concession 10, east to Bedford boundary at Lot 26, Concession 1, 1¾ miles of old road repaired, graded 80 rods, surfaced with gravel 400 rods. Road No. 3, Ruttan and Wager Road, 3 miles of old road repaired by light grading and taking out stone, side-brushed 150 rods, graded 126 rods, surfaced with gravel 140 rods and 6 tile culverts placed. Road No. 4, Bush and Oak Flats Road, 2 miles of old road improved by blasting out stone, grading 220 rods and surfacing 450 rods. Road No. 5, Haddock and Parham Road, 1½ miles old road improved, graded 133 rods, gravelled 200 rods, ditched 200 rods and 3 stone culverts built. Road No. 6, Echo Lake Road, 1¾ miles of old road improved by grading 200 rods and surfacing 110 rods with stone.

Horton By-law No. 299.—Road No. 1, from Government Road on Lot 14, one 40 ft. steel culvert placed, concrete wing walls built. Road No. 2, on the Pinnacle Road from Renfrew to Lot 17, Concession 1, 90 rods graded and gravelled. Road No. 3, on Lot 5, on 5th Concession, 80 rods graded and gravelled and one 36 ft. steel culvert placed. Road No. 4, on the 8th Concession line at Lot 4, one 40 ft. steel culvert placed and concrete wing walls built. Road No. 5, between Lots 20 and 21, Concession 7, 40 rods along a hill graded and gravelled. Road No. 6, Thompson Road from Early's to Bonnechere Point, 320 rods graded and gravelled. Opeongo Road at Lot 10, 240 rods graded and gravelled.

Huntingdon By-law No. 347.—Road No. 1, between Concessions 9 and 10, Lots 2 to 5, 160 rods old road surfaced with gravel. Road No. 2, between Lots 18 and 19, Concessions 10 and 11, 80 rods graded and 20 rods gravelled. Road No. 3, Huntingdon and Thurlow boundary, Lots 3 to 6, 40 rods graded and gravelled, the work being chiefly cutting down a very steep hill. Road No. 4, between Concessions 12 and 13, across Lots 2 to 5, 80 rods graded and gravelled. Road No. 5, in an easterly direction through Lots 3 and 5, across Concession 2, 80 rods graded and 120 surfaced with gravel. Road No. 6, between Concessions 3 and 4, Lots 6 to 15, 65 rods old road graded and 100 rods gravelled.

Kennebec By-law No. 12.—Road No. 1, the Arden and Olden Road, 1½ miles old road repaired, graded 156 rods, 276 rods gravelled, 2 cedar and 3 stone culverts. Road No. 2, the Arden and Tamworth, 2 miles of old road repaired, 6 hills cut down 5 ft. and filled in with stone at bottom, 36 rods graded and 137 rods gravelled, 70 rods ditched and one concrete and 2 cedar culverts placed. Road No. 3, the Arden and Kaladar Road, 3 miles of old road repaired, 3 hills cut down from one ft. to 6 ft., 64 rods filled with stone, then gravelled; considerable blasting done, 156 rods graded, 156 rods gravelled and 160 rods ditched. Road No. 4, Arden and Harlowe Road, 2 miles of old road repaired, graded 244 rods, crowned with gravel 210 rods and 4 cedar culverts built.

Lakefield By-law No. 515.—Road No. 1, Apsley Road, between Concessions 7 and 8, from Lots 26 to 28, Smith, 110 rods old road graded and crowned with stone.

Limerick By-law No. 8.—Road No. 1, between Concessions 1 and 2, Lots 15 and 16, and between Concessions 8 and 9, Lots 39 and 40, on old Hastings Road, ½ mile of new road opened up, 80 rods being cleared, stumped and grubbed and 80 rods graded and one cedar culvert placed: 3 miles of old road improved, side-brushed 160 rods, graded 964 rods, crowned with broken stone 300 rods, 6 stone and 8 cedar culverts placed, 2 16 ft. cedar bridges built and a stone fill of 380 rods.

Loughboro' By-law No. 60*A*.—Road No. 1, the Sydenham Road, 1½ miles of this road improved, 163 rods graded, 332 rods crowned with broken stone and 310 rods ditched. Road No. 2, between Lots 3 and 4, across Concessions 1, 2, 3, 4. On the Wilure Road, 213 rods graded, 286 rods surfaced with stone and 4 tile culverts placed. Loughboro' and Portland boundary, Concession 14 to Concession 9, 315 rods crowned with broken stone.

Madoc By-law No. 335.—Road No. 1, between Concessions 8 and 9, Lots 4 to 7, 120 rods old road graded and gravelled, considerable rock blasted out of ditches and 2 stone culverts placed. Road No. 2, between Lots 5 and 6, across Concessions 8 and 9, 80 rods graded and gravelled. Road No. 3, Lots 29 to 26, Concessions 9 and 10, 120 rods old road side-brushed, graded and gravelled. Road No. 5, from Lots 18 to 21, Concession 10, 64 rods graded and gravelled and one cedar culvert placed. Road No. 6, between Lots 5 and 6, in the 6th Concession, 160 rods graded and 120 rods surfaced with gravel. Road No. 7, from Lot 11, Concession 1, to Lot 6, in Concession 3, 180 rods graded and 100 rods crowned with gravel. Road No. 8, between Lots 23 and 24, Concession 10, 160 rods graded and gravelled and 2 cedar culverts placed. Road No. 9, between Lots 16 and 17, Concession 5, 80 rods graded and gravelled and one cedar culvert built.

Mara By-law No. 482.—Road No. 1, on the line between Concessions 9 and 10, from Lots 11 to 19, 219 rods crowned with stone and one cedar culvert built. Road No. 2, across Concessions A to 5, between Lots 10 and 11, 1½ miles of old road improved, surfaced with gravel 389 rods and one cement culvert being put in. Road No. 3, north-west through Lots 11, 12, 13, 20 and 28, Concessions 5, 6, 7, 10, 1½ miles old road improved, 200 rods graded, 389 rods crowned with crushed stone, 40 rods ditched, earth fill 20 rods long and 2 concrete culverts placed. Road No. 5, between Concessions 10 and 11, Lots 24, 25 and 26, 260 rods surfaced with crushed stone. Road No. 6, Monck Road, Lots 18 to 22, 50 rods graded and 210 rods crowned with stone.

Marmora and Lake By-law No. 478.—Road No. 1, Marmora and Belmont boundary, Lots 29 to 32, 60 rods graded and 244 rods crowned with gravel. Road No. 2, Lot 13, Concession 9, 250 rods graded, 200 rods surfaced with gravel and one metal culvert placed. Road No. 3, between Lots 23 and 24, Concession 4, 80 rods graded and 162 rods gravelled. Road No. 4, between Concessions 4 and 5, Lots 18 to 20, 200 rods gravelled. Road No. 5, Lots 9 and 10, Concession 3, 100 rods graded and gravelled and 3 cedar culverts placed. Road No. 6, Lots 9 and 10, between Concessions 5 and 6, 40 rods side-brushed, 80 rods graded and gravelled and considerable blasting done through a rocky hill.

Martland By-law No. 79.—Road No. 1, across Concessions 1 to 6, 1½ miles of old road graded and 5 culverts placed, ½ mile of new road was stumped and grubbed. Road No. 2, between Concessions 1 and 2, Lots 1 to 12, one mile

of old road improved, 5 wood culverts placed and 7 rods ditched. Road No. 3, between Concessions 2 and 3, Lots 1 to 12, 2 miles of old road graded and one bridge repaired and a small fill made. Road No. 4, on line between Concessions 3 and 4, Lots 1 to 6, 70 rods of new road cleared and one mile of old road graded. Road No. 5, between Concessions 5 and 6, Lots 1 to 21, 80 rods graded and ditched, 2 culverts placed and a fill of 90 yards made.

Mayo By-law No. 266.—Road No. 1, between Concessions 14 and 15, Lots 13 to 16, 80 rods of old road graded, 3 stone and one cedar culverts placed and a fill of 400 yds of earth and rock made at the foot of a hill. Road No. 2, Carlow and Mayo boundary, Lots 18 to 20, 160 rods graded, 100 rods gravelled and 5 cedar culverts built. Road No. 3, in front of Concession A, Lots 28 to 26, 200 rods of old road graded, 100 rods gravelled and 3 cedar culverts placed.

Monteagle and Herschel By-law No. 425.—Road No. 1, from Lots 7 to 9, Concession 6, 200 rods old road graded and 5 cedar culverts built. Road No. 2, Lots 11 to 14, Concession 6, 280 rods graded and 5 cedar culverts placed. Road No. 3, from Lot 17 south of Haley's Hill, 160 rods graded and one cedar culvert built. Road No. 4, Lots 17 to 20, Concession 2, 240 rods graded, 200 rods crowned with broken stone and 3 cedar culverts built. Road No. 5, between Lots 20 and 21, south ½ mile from Concession 12, 160 rods graded and 20 rods crowned with broken stone and 4 stone culverts built. Road No. 6, south from the Peterson Road, between Lots 20 and 21, 200 rods side-brushed and graded and 3 cedar culverts placed. Road No. 7, Lots 13 to 15, Concession 14, 240 rods side-brushed and graded and 6 cedar culverts placed. Road No. 8, Faraday, and Herschel Townline, Lots 28 and 29, 80 rods of new road cleared, 40 rods graded and 40 rods corduroyed, 2 cedar culverts and one 16 ft. cedar bridge built, a stone fill of 400 yds. and also ½ mile of old road improved. Road No. 9, from the south end Lot 30, Concession 2, north ½ mile, 160 rods side-brushed, 240 rods graded and 4 cedar culverts placed. Road No. 10, between Lots 5 and 6, Concession 14, 160 rods of road side-brushed and graded and 2 cedar culverts built.

Murray By-law No. 802.—Road No. 5, Wooler Gravel Road from Trenton to Brighton Townline, 1,570 rods of old road graded and gravelled and 3 concrete culverts, with concrete wing walls, constructed.

Newburg By-law No. 186.—Road No. 1, between Concessions 1 and 2, Lots 16 to 12, 318 rods of old road graded and crowned with broken stone. Road No. 2, Napanee Street, Lots 18 to 15, Concession 1, 234 rods of old road crowned with broken stone.

North Monaghan By-law No. 682.—Under this By-law a rock-crusher and rotary-screen were purchased.

Olden By-law No. 32B.—Road No. 1, the Frontenac Road, northerly from the south boundary of Lot 21, Concession 6, 265 rods old road improved by grading 70 rods, surfacing with earth 203 rods and putting in 3 tile culverts. Road No. 2, the Long Lake Hungry Bay Road, one mile of old road improved by grading 40 rods and surfacing with earth. Road No. 3, Arden and Oso Road, 2 miles of old road improved, side-brushed 70 rods, graded 65 rods and surfaced with earth 150 rods. Road No. 4, Tamworth and Beverly Road, one mile of old road improved by grading 42 and surfacing with earth 65 rods. Road No. 5, McLean Road, ½ mile of new road opened up and 25 rods of old road repaired, 15 rods were crowned on a hill. Road No. 6, the Babcock Road, ½ mile of old road improved by grading 15 rods, surfacing with broken stone 10 rods and

putting in 2 tile culverts. Road No. 7, Storms and Sharbot Lake Road, 1¼ miles of old road improved by blasting out stone, grading 25 rods and surfacing a hill 40 rods. Road No. 8, Chapman and Garrett Road, 1½ miles of old road improved, graded 40 rods, crowned 55 rods and 4 tile culverts placed. Road No. 9, the Clarendon Road, 85 rods of a hill crowned. Road No. 10, Duesharn Road, 65 rods of old road graded. Road No. 11, Dawson and Drew Road, 35 rods graded and 40 rods were crowned. Road No. 12, the Flynn Road, ¼ mile of old road improved by grading 25 rods, crowning hill 15 rods and putting in 4 tile culverts. Road No. 13, Fox-Ewens Road, ½ mile of old road improved by grading 25 rods, crowning a hill 5 rods and placing 4 tile culverts. Road No. 14, Vealey Road, ½ mile of old road improved by removing stone and crowning 75 rods on a hill.

Oso By-law No. 74.—Road No. 2, between Lots 11 and 12, Concession 7, a new road 78 rods in length built around a hill, being graded and gravelled and from 2 to 8 ft. of stone being put on the road side. Road No. 5, Keeler's Road, between Lots 16 and 17, Concessions 2 and 3, 261 rods of old road graded, 75 rods gravelled, 88 rods ditched, 4 stone culverts placed and 4 yds. of rock blasted out. Road No. 6, Lots 23 and 24, Concession 4, Garrett Road, 30 rods of old road improved by grading 30 rods; a 24 ft. cedar bridge was built over Volten Creek and the approaches filled with stone. Road No. 7, Lot 2, Concession 4, to Lot 1, Concession 6, Bolingbroke Road, 288 rods of new road opened up by stumping, clearing and grading, making a fill of log and stone 156 rods in length and putting in one stone culvert. Road No. 8, Sharbot Lake Road, Lots 13 to 16, Concession 3, 263 rods of old road graded, 498 rods gravelled, ditched 96 rods and one iron culvert placed.

Pittsburg By-law No. 12.—Road No. 1, between Concessions 4 and 5, from Lots 12 to 32, 4½ miles of old road improved by being crowned with broken stone, 335 rods were graded and 3 culverts placed. Road No. 2, between Concessions 10 and 11, Lots 34 to 38, 185 rods old road graded and 111 cords stone piled. Road No. 3, on the road in Concession 2, north-east from Lots 19 to 24, one 16 ft. concrete and steel bridge constructed, concrete abutments, steel frame and concrete floor.

Portland By-law No. 548.—Road No. 1, Concessions 1 and 3, Lots 9 to 11, 336 rods crowned with broken stone and 2 concrete culverts placed. Road No. 2, between Lots 6 and 7, across Concessions 1, 2, 3, 320 rods old road crowned with broken stone. Road No. 3, Camden boundary, 206 rods old road graded, 336 rods crowned with broken stone and 4 tile culverts placed. Road No. 4, Loughboro' and Portland boundary, Lots 9 to 12, ¾ mile old road improved by cutting down a heavy hill, blasting out stone, grading 103 rods, surfacing with broken stone 151 rods and putting in one 12 in. tile culvert. Road No. 5, Stone Dam Road, Concession 13, Lots 1 to 4, 97 rods old road graded, 280 rods crowned with broken stone and 300 rods ditched.

Richmond By-law No. 593.—Road No. 2, between Lots 20 and 21, Concessions 6 to 11, 248 rods of old road graded, 160 rods crowned with broken stone and 4 tile culverts placed. Road No. 4, Richmond and Tyendinaga boundary, Concessions 7 and 8, 150 rods old road graded, 126 rods crowned, 256 rods ditched and 4 tile culverts placed.

Rawdon By-law No. 339.—Road No. 1, from rear Concession 13 to front Concession 13, then south-west from Lots 7 to 13, 2 miles of old road graded and gravelled and one cedar culvert built.

Ratter and Dunnett By-law No. 86.—Road No. 1, between Concessions 1 and 2, Lots 1 to 12, 3 miles of old road improved by grading 2 miles and gravelling one mile, and ditching 80 rods. Road No. 2, between Lots 8 and 9, Dunnett, across Concession 1, ¾ miles old road improved by grading ¼ mile and gravelling ½ mile. Road No. 3, between Lots 6 and 7, across Concessions 4 to A, 1½ miles old road improved by grading one mile and gravelling ½ mile. Road No. 4, boundary of Appleby and Dunnett, from Concession 3 to Lot 12, Concession 1, 1¾ miles of old road improved by grading 1½ miles and gravelling ½ mile. Road No. 5, between Concessions 4 and 3, from Lots 6 to 12, 1¼ miles of old road improved by grading one mile, gravelling ¼ mile and ditching ½ mile. Road No. 6, between Concessions 4 and 5, from Lots 6 to 10, ¾ mile of old road improved by grading ¼ mile, gravelling ½ mile and ditching ½ mile. Road No. 7, along C. P. R. from Lots 1 to 4 and the boundary between Ratter and Dunnett, 2¾ miles of old road improved by grading 1½ miles, gravelling 1½ miles and ditching ½ mile. Road No. 8, from Warren Village to Deer Creek in Ratter, one mile of old road improved by grading ½ mile, gravelling ½ mile and ditching ½ mile.

Ross By-law No. 311.—Road No. 1, between Concessions 6 and 7, Lots 22 to 25, 120 rods old road graded and gravelled. Road No. 2, Concession 8, Lots 25, 26, 27, 80 rods of old road graded and gravelled. Road No. 3, in a northerly direction through Lots 9, 8, 7, across Concession 5, 120 rods of old road graded and gravelled. Road No. 4, Ross and Bromely boundary, Lots 15 to 17, 2 miles of old road graded and surfaced with loam. Road No. 5, Proof line between Lots 20 and 21, Concessions 7 and 8, 80 rods of old road graded and gravelled. Road No. 6, Haley Station Road, 120 rods of old road gravelled. Road No. 7, Lot 9, Concession 3, to proof line between Lots 10 and 11, 80 rods of old road surfaced and graded, 100 yds. of rock blasted out. Road No. 8, Coben-Pembroke Road, to complete the Townline between Ross and Westmeath, 80 rods of old road graded and gravelled. Road No. 9, between Concessions 4 and 5, north from Lot 20, 120 rods of old road graded and gravelled. Road No. 10, Government road from point in Lot 8 easterly between Lots 10 and 11, 240 rods of old road graded and gravelled. Road No. 11, from Government Road to Queen's line, 120 rods of old road graded and gravelled and one 40 ft. cedar bridge built.

Rear Leeds and Lansdowne By-law No. A.—Road No. 2, road running easterly through Lots 6, 7, 8, 9, on the 2nd Concession line, from Lot 5, Concession 11, to Lot 10, Concession 11, rear of Lansdowne, one mile of new road opened up but not completed, 2 hills were cut down, 250 rods cleared 40 ft. wide, 52 rods corduroyed and 2 wooden bridges, one 16 ft. the other 22 ft. span, erected.

Seymour By-law No. 868. Road No. 1, from Concession 1, Brighton Township, to Campbellford, 662 rods old road graded and 982 rods covered with crushed stone. Road No. 2, Campbellford to Trent River, Concession 7, 531 rods of old road gravelled and 4 concrete culverts placed.

Smith By-law No. 721.—Road No. 3, north-easterly through Lots 41 and 42, Concession 14, 80 rods of old road graded and 85 rods crowned with broken stone. Road No. 5, in a north-easterly direction through Lots 41 and 42, across Concession 15, 156 rods of old road graded and surfaced with gravel and stone.

Stafford By-law No. 639.—Road No. 1, between Concessions 2 and 3, Lots 2 to 4, 130 rods of old road graded and gravelled. Road No. 2, between Lots 6 and 7, across Concession 1, 100 rods of old road graded and 40 rods

gravelled. Road No. 3, Lots 27 and 28, Concession 1, 120 rods old road graded and 45 rods gravelled. Road No. 4, Stafford and Town of Pembroke boundary, Lots 34 to 32, 120 rods of old road graded and 45 rods gravelled. Road No. 5, between Concessions 4 and 5, Lots 2 to 4, 200 rods of old road graded and gravelled. Road No. 6, from centre of Lot 19 to centre of lot 20, a continuation of 1911 improvements, 80 rods of new road stumped, graded and gravelled.

Storrington By-law No. 451.—Road No. 1, Concession 6, Lots 14 to 10, 167 rods of old road graded, 235 rods gravelled, 300 rods ditched and one concrete culvert placed. Road No. 2, Concession 8, Lots 5 and 10, 40 rods old road graded and 106 rods crowned with loam. Road No. 3, in an easterly direction through Lots 4 and 3, Concession 10, 237 rods of old road graded and gravelled and one tile culvert, 116 ft. long, placed.

Springer By-law No. 273.—Road No. 1, between Concessions 1 and 2, from Sturgeon Falls to the boundary of Springer and Caldwell, 4½ miles of old road improved by general repairs. Road No. 2, between Concessions 2 and 3, from Lots 1 to 14, 7½ miles of new road cleared, graded and ditched. Road No. 3, between Concessions 1 and A, from Lots 1 to 9, 3½ miles of old road improved, by making general repairs.

South Crosby By-law No. 799.—Road No. 1, in front of Concession 2, from Lots 22 to 27, 1¼ miles of old road improved, 50 rods graded, 300 cords of stone piled and partly crushed with crusher. Road No. 2, running north-westerly through Lots 14, 15, 16, Concession 2, ¾ mile of old road improved by making a stone fill 12 rods long, 24 ft. wide, from 3 to 5 ft. deep, making a proper crossing to the C. N. R. This fill was covered with gravel and 50 cords of stone was piled for crusher.

Tudor and Cashel By-law No. 8.—Road No. 1, Lot 18, east to Lot 21, Concession A, Tudor, ¾ mile of old road crowned with broken stone. Road No. 2, road running west between Lots 20 and 21, West Hastings Road from south side Lot 19, 110 rods of old road crowned with broken stone. Road No. 3, road from Gilmour at Lot 12, Concession 18, easterly to boundary of Limerick and Cashel, 325 rods of old road graded, 265 rods crowned with broken stone, one stone and 2 cedar culverts placed, one 20 ft. cedar bridge built and 110 loads of stone piled for crusher. A stone crusher was also purchased under this By-law.

Tyendinaga By-law No. 627.—Road No. 1, between Concessions 7 and 8, Lots 31 to 32, 120 rods of old road gravelled. Road No. 2, across Concession 2; Lots 15 and 16, 160 rods of old road side-brushed and graded. Road No. 3, between Concessions 6 and 7, Lots 34 to 40, 120 rods of old road graded and gravelled. Road No. 4, between Lots 15 and 16, across Concessions 4 and 5, 60 rods of old road graded and 80 rods gravelled. Road No. 5, between Concessions 4 and 5, from Lots 15 to 10, 40 rods of old road cleared and graded and 128 rods crowned with gravel. Road No. 6, between Lots 10 and 11, across Concession 2, 80 rods of old road graded and gravelled. Road No. 7, between Concession 3 and 4, from Lots 25 to 20; 200 rods of old road surfaced with gravel. Road No. 8, between Concessions 2 and 3, from Lots 35 to 40, 163 rods of old road crowned with gravel.

Westmeath By-law No. 107.—Road No. 1, between Concessions 4 and 5, E.M.L., Lots 11 and 12, 200 rods of old road graded and gravelled. Road No. 2, between Concessions 6 and 7 E.M.L., Lots 7 and 8, 240 rods of old road graded and gravelled. Road No. 3, between Concessions 15 and 16, Concession 8 E.M.L., 160 rods of old road graded and surfaced with gravel. Road

No. 4, Westmeath and Pembroke Road, Lots 29, 1 and 2 Range N.F.M., 160 rods of old road graded and surfaced with gravel. Road No. 5, 3rd Concession C.L.F., Lots 8, 9, 10, 240 rods graded and gravelled. Road No. 6, between Lot 17, in 3rd Concession E.M.L. and Range N.F.A.; thence northerly between Lots 6 and 7 to Westmeath and Pembroke Road, one mile of old road graded and gravelled. Road No. 7, on the line between Concession B, E.M.L. and Concession 2, W.M.L., opposite Lots 24 to 27, 500 rods of old road graded and surfaced with gravel.

Wolfe Island, By-law No. 417.—Lots 60 to 100 S, 10 rods of old road graded and crowned with broken stone. Road No. 2, across Concessions 7 and 8 O.L.S., 410 rods of old road graded and crowned with broken stone and one 18 ft. concrete culvert placed.

Wollaston By-law No. 11.—Road No. 1, between Concessions 8 and 9, Lots 15 to 32, 80 rods of old road side-brushed, 408 rods graded and 3 cedar culverts put in. Road No. 2, between Lots 15 and 16, Concessions 9 to 16, 40 rods of old road side-brushed, 324 rods graded and gravelled and one cedar culvert built. Road No. 3, road north-westerly from Lots 16 to 32, Concessions 10 to 13, 40 rods of old road side-brushed, 200 rods graded and 160 rods crowned with gravel to a width of 7 ft.

TEMISKAMING DIVISION.

Armstrong, between Concessions 5 *and* 6, *Lots* 8 *to* 12.—Two and one-half miles of new road opened up through a hilly location, 480 rods being cleared, 640 rods graded, 96 rods ditched, seven wood culverts put in, two wood bridges, one 24 ft. the other 90 ft. erected and a fill of 3,430 cubic yds.

Armstrong, between Concessions 1 *and* 2, *Lots* 11 *and* 12.—Three-quarters of a mile of new road cleared, stumped and graded, two wood culverts and one 18 ft. wooden bridge built, and a fill of 25 cu. yds.

Armstrong, between Concessions 2 *and* 3, *Lots* 8 *to* 12.—One mile of new road opened up, stumped and grubbed; blasting was done on 58 rods, 190 rods graded, 32 rods gravelled, one wood culvert placed and 3,182 cu. yds. of earth side-cuts. On the old road two miles graded and one wood culvert placed.

Armstrong, between Concessions 4 *and* 5, *Lots* 1 *to* 4.—One mile of old road graded and ¾ mile of new road stumped, graded and ditched, one wood culvert placed, and a cut of 738 cu. yds. made.

Armstrong, South Boundary, Lots 7 *to* 10.—Two miles of old road graded, 20 rods ditched, rock cut 34½ yds., earth fill 435 cu. yds, and nine wood culverts put in.

Beauchamp, between Lots 6 *and* 7, *across Concession* 1.—Two hundred and seventy rods of new road stumped and graded, nine wood culverts placed, and a cut of 200 yds. of earth made.

Beauchamp, between Lots 2 *and* 3, *Concession* 3.—One mile of old road improved, 20 rods stumped and stone-grubbed, 30 rods gravelled, 60 rods ditched, earth cut 721 cu. yds., rock cut 15 cu. yds., and three wood culverts placed.

Brethour, between Concessions 1 *and* 2, *Lots* 9, 10, 11.—One mile of new road opened up, 300 rods cleared, 160 rods stumped, 160 rods graded, 820 rods ditched, and one 50 ft. and one 60 ft. wooden bridges built.

Brethour, South Boundary, across Lots 1 *to* 6.—Two miles of new road opened up, 320 rods cleared, 240 rods stumped and stone removed, 160 rods graded, 134 rods gravelled and 320 rods ditched.

Brethour, South Boundary, Lots 7 to 11.—Two miles of new road opened out, cleared 480 rods, stumped and grubbed 360 rods, graded 258 rods, corduroyed 198 rods, ditched 516 rods, and two wood culverts placed.

Brethour, between Concessions 4 and 5, Lots 4 to 9.—Two miles of new road cleared, stumped and grubbed, 422 rods ditched, six wood culverts placed and an earth fill of 80 cu. yds.

Brethour, between Concessions 5 and 6, Lots 5 to 8.—Two miles of new road opened up, cleared 400 rods, stumped and grubbed 220 rods, graded 320 rods, ditched 640 rods, four wood culverts placed and at a small stream a culvert and fill of 208 cu. yds. of a very substantial character made.

Bryce, South Boundary, across Lots 9 to 12.—Two miles of new road cleared and 320 rods stumped and grubbed.

Bucke, Centre of Lot 4, Concession 5.—One hundred and sixty rods of new road stumped, graded and ditched on both sides and four wood culverts placed.

Bucke, between Concessions 4 and 5, from Lakeshore.—Two hundred and forty-three rods of new road cleared, stumped, grubbed, boulders removed and graded, three wood culverts placed, and covering put on a 16 ft. wooden bridge.

Bucke, North Boundary, Lots 1 and 2.—One hundred and sixty rods of new road cleared, stumped and graded, and four wood culverts built.

Bucke, West Boundary.—Four hundred rods of new road graded through a very stony location, 40 rods being stumped and boulders removed, 143 rods surfaced with gravel, 835 rods ditched, earth fill 251 yds. and six wood culverts placed.

Bucke, between Lots 8 and 9, Concessions 5 and 4.—One and one-quarter miles of old road, mostly on a stony ridge, improved by clearing stones and logs from 200 rods, stumping 320 rods, grading 107 rods, making a fill of 1,329 cu. yds. and putting in three culverts.

Cane, between Lots 10 and 11, Concession 4.—One hundred and sixty rods of new road cleared, stumped and grubbed, 20 rods graded, one wood culvert placed, and a cut of 200 yds. made.

Cane, between Lots 8 and 9, across Concessions 2 to 5.—One mile of new road opened up, 250 rods stumped, 320 rods graded, 50 rods ditched, 19 rods corduroyed, and four wood culverts placed.

Casey, between Concessions 2 and 3, across Lot 6, then South.—One and three-quarter miles of new road constructed, cleared 135 rods, stumped and grubbed 240 rods, graded 200 rods, gravelled 76 rods, ditched 335 rods.

Casey, between Concessions 2 and 3, across Lots 10 and 11.—One mile of new road opened out, 288 rods cleared, 188 rods stumped and grubbed, and 160 rods ditched.

Casey, between Lots 2 and 3, across Concessions 1, 2, 3.—One and one-half miles of new road opened up, 320 rods being cleared, stumped and grubbed, 122 rods graded, and 72 rods of an outlet ditch.

Casey, between Concessions 3 and 4, Lots 9, 10, 11.—Five hundred rods of new road cleared, stumped and grubbed, 660 rods graded and 760 rods ditched.

Casey, between Concessions 2 and 3, Lots 2 and 1, and Lot 12, in Harley.—Two hundred and ninety-five rods of new road cleared, 400 rods stumped and grubbed, and 320 rods ditched.

Casey, West Boundary, across Concessions 1, 2, 3.—Two miles of old road improved by surfacing 280 rods with earth and making a fill of 360 cu. yds., and one mile of new road was cleared, stumped and graded.

Casey, between Lots 8 and 9, across Concessions 4, 5, 6.—Three hundred and twenty rods of new road cleared, stumped and ditched on one side and two wood culverts erected.

Casey, between Concessions 5 *and* 6, *Lots* 1, 2, 3.—One hundred and sixty rods of new road stumped and grubbed, 80 rods graded, four rods corduroyed and covered with earth, 195 rods ditched and one wood culvert placed.

Dack, Concessions 3 *and* 4, *from Sunday Creek, to Lot* 6—Three-quarters of a mile of new road opened up, 80 rods stumped and grubbed, 220 rods graded, two hills graded and a fill of 200 cu. yds. of earth and one wood culvert put in.

Dack, between Lots 6 *and* 7, *Concessions* 1 *and* 2, *thence West.*—Three hundred and ninety rods of new road cleared, 500 rods stumped and grubbed, 580 rods graded, and 15 wood culverts built.

Elk Lake, Shore Road, from Township of Cane to Elk City.—One mile of new road stumped and graded and seven wood culverts built.

Evanturel, South Boundary, Lots 11 *and* 12, *and West Boundary, Concessions* 1 *and* 2.—Two and three-quarter miles of new road opened out, two miles stumped and grubbed, 2¾ miles graded, a fill of 446 cu. yds. of earth and 3 wood culverts built.

Evanturel, between Concessions 5 *and* 6, *Lots* 1 *to* 9.—Half mile of old road improved by grading 120 rods and putting in 4 wood culverts; one mile of new road was cleared, stumped and graded, 25 rods of outlet ditches, five wood culverts, and several small ravines filled amounting to 500 yds.

Evanturel, between Lots 8 *and* 9, *Concessions* 3 *and* 4.—One mile of new road through heavily timbered green bush cleared, stumped and grubbed.

Evanturel, Koch Road.—Thirty-eight rods of new road stumped, 24 rods graded, 58 rods ditched, 300 yds. sidehill cut, one wood culvert and one 24-ft. wood bridge built.

Firstbrook, between Concessions 4 *and* 5, *Lots* 1 *to* 12.—Three miles of old road improved by grading 320 rods, surfacing with earth 133 rods, ditching 25 rods, and covering one 62-ft. bridge.

Harley, between Concessions 3 *and* 4, *Lots* 2 *and* 6.—Four hundred rods of new road cleared, stumped, and grubbed, 80 rods graded, 184 rods ditched, 375 rods of corduroy, and fill of 121 cu. yds. of earth.

Harley, between Lots 10 *and* 11, *Concessions* 1 *and* 2.—Two miles of new road opened up, cleared 560 rods, stumped, grubbed and graded 460 rods, ditched 960 rods and four wood culverts built.

Harley, between Concessions 2 *and* 3, *Lots* 4, 5, 6.—Three-quarters mile of old road improved by putting in two wood culverts, ditching 30 rods, and making an earth fill of 4,289 cu. yds.

Harley, between Lots 2 *and* 3, *Concession* 2.—One and one-half miles of new road opened up, cleared 110 rods, stumped and grubbed 360 rods, levelled and graded 400 rods, ditched 320 rods, and two wood culverts placed.

Harley, between Concessions 5 *and* 6, *Lots* 3 *and* 4.—Three hundred and twenty rods of new road cleared, stumped and ditched on one side, 160 rods graded, and two wood culverts built.

Harley, between Lots 6 *and* 7, *across Concession* 2.—Two hundred and eighty rods of new road cleared, stumped and grubbed, 320 rods graded, two wood culverts placed, and fill of 254 cu. yds. of earth made.

Harley and Kerns Boundary, Concessions 4, 5, 6.—Two miles of new road cleared, stumped and grubbed, 100 rods corduroyed, surfaced with earth and ditched, and one wood culvert built.

Harris Main Road.—Lot 1, Concession 3, east, 177 rods of road crowned with gravel, thence north 65 rods crowned with gravel, 300 rods graded. Lots 4 and 3, 160 rods sidebrushed, 59 rods graded, 105 rods surfaced with gravel, 380 rods ditched, and a cut of 70 cu. yds.; part of the work was around a stony sidehill and dynamite was required to break up the road. Lot 2, eastward, then north, in Concessions 3 and 5, 263 rods of old road gravelled and 60 rods graded.

Harris, across Concession 6, between Lots 2 and 3.—One-half-mile of new road constructed, 125 rods being stumped and graded and 155 rods ditched.

Harris, between Concessions 4 and 5, from Lot 2 west to boundary.—One mile of new road opened up, cleared 160 rods, stumped and graded 320 rods, one wood culvert, two fills of stone amounting to 324 cu. yds. were made in a soft place in the road and in bog hole.

Harris, between Lots 4 and 5, across Concessions 4 and 5.—Four hundred and thirty rods of new road cleared, 350 rods stumped, 375 rods ditched, and 4 wood culverts placed.

Harris and Casey Boundary, Lots 3 and 4.—One-half mile of new road opened up, stumped 30 rods, graded 140 rods, surfaced with earth 160 rods, ditched 140 rods.

Harris and Dymond Boundary, from 3rd Concession.—One-half mile of new road constructed, stumped and grubbed 80 rods, graded 126 rods, ditching 258 rods, fill 1,800 cu. yds. and 4 wood culverts put in.

Hudson, north Boundary, Lots 1 and 2.—One mile of old road improved, the nature of the ground is stony, an earth cut of 3,126 cu. yds. was made and a stone fill of 622 cu. yds. which was covered with earth, graded 160 rods, gravelled 153 rods, and placed 2 culverts.

Hudson, between Concessions 5 and 6, Lots 3 and 4.—Two hundred and seventy-three rods graded and crowned with broken stone covered with fine gravel.

Hudson, between Lots 8 and 9, across Concession 6.—One mile of new road stumped, graded and ditched, 2 wood culverts placed, and 40 rods of outlet ditches constructed.

Hudson, between Lots 2 and 3, Concessions 1 and 2.—One and one-half miles of new road opened up, 160 rods stumped, boulders removed, graded 240 rods, ditching 550 rods.

Henwood, between Lots 6 and 7, across Concessions 3 and 4.—Three hundred and twenty rods of old road graded, 2 wood culverts placed and 10 rods ditched.

Henwood, between Lots 2 and 3, across Concession 5.—One mile of old road graded, 160 rods being stumped 15 ft. wide.

Henwood, between Lots 6 and 7, Concession 5.—One mile of new road opened up, 160 rods cleared 50 ft. wide, 320 rods stumped and grubbed, 160 rods graded, and 2 wood culverts built.

Henwood, between Concessions 3 and 4, Lots 1 to 10.—Two hundred and forty rods of old road graded, 2 wood culverts placed, 1 bridge re-covered with plank, and the approaches repaired, 160 rods of new road stumped and graded and 1 wood culvert built.

Henwood, between Concessions 2 and 3, across Lot 4.—One mile of new road opened up, 130 rods being graded, 4 wood culverts and one 54 ft. timber bridge built and a cut of 500 cu. yds. made.

Henwood, between Lots 8 and 9, Concessions 5 and 6.—One mile of new road through dry, sandy soil cleared, stumped and graded, and 1 wood culvert built.

Henwood, between Lots 8 *and* 9, *Concessions* 4 *and* 3.—One mile of old road repaired by stumping 80 rods and grading 320 rods and 1 mile of new road cleared, stumped and graded, and 3 wood culverts put in.

Henwood, between Concessions 5 *and* 6, *across Lots* 1 *and* 2.—Three hundred rods of new road cleared, stumped and grubbed and 160 rods graded.

Henwood, west Boundary, across Concession 4.—One mile of new road cleared, stumped and grubbed, 70 rods ditched, 1 wood culvert and one 60 ft. timber bridge built.

Henwood, between Lots 10 *and* 11, *across Concessions* 4 *and* 3.—Four hundred and eighty rods of new road cleared, 320 rods stumped, 350 rods graded, 11 wood culverts and two 50 ft. wood bridges erected and a fill of 1,000 yards of earth.

Hilliard, between Concessions 4 *and* 5, *Lots* 9 *to* 12.—Six hundred and ninety-two rods of new road cleared, 579 rods stumped, 48 rods graded, 943 rods ditched, and a fill of 80 cu. yds. of earth.

Hilliard, between Concessions 4 *and* 5, *Lots* 1 *to* 6.—Two miles of old road improved by stumping 400 rods, grading 640 rods, surfacing with earth 300 rods, putting in 3 wood culverts, renewing a cover on a bridge 100 ft. in length, and putting in piles and caps under a 128 ft. bridge and ditching 685 rods.

Hilliard, between Lots 8 *and* 9, *across Concessions* 1 *and* 2.—Two and one-half miles of old road across a muskeg put in a substantial condition by stumping 400 rods, grading 90 rods, ditching 640 rods, putting in 70 rods of new corduroy and repairing 1 mile of old corduroy where necessary and building 2 wood culverts.

Hilliard, between Concessions 1 *and* 2, *Lots* 9 *and* 10.—One mile of old road graded, 160 rods crowned with earth, and 180 rods ditched, a new piece of road 50 rods in length was cleared, stumped and graded.

Hilliard, between Concessions 1 *and* 2, *Lots* 6, 7, 8.—One and one-half miles of new road opened up, 400 rods cleared, 240 rods stumped, 30 rods graded, 40 rods corduroyed, 60 rods ditched, fill 940 cu. yds. earth and 1 wood culvert placed.

Hilliard, between Concessions 3 *and* 4, *across Lots*, 5, 6, 7, 8.—One and one-half miles of new road through a deep muskeg stumped 30 ft. wide.

Hilliard, between Concessions 5 *and* 6, *Lots* 9 *and* 10.—Ninety-eight rods of new road stumped and graded, 109 rods corduroyed, 119 rods crowned with earth, 238 rods ditched, a fill of 700 cu. yds. of earth and 2 wood culverts placed.

Ingram, between Lots 4 *and* 5, *Concessions* 5 *and* 6.—Three hundred and twenty rods of new road cleared, 400 rods stumped, 350 rods graded, 4 wood culverts and one 20 ft. wood bridge built.

Ingram, between Concessions 3 *and* 4, *from Lot* 8, *east.*—Eighty rods of new road cleared, 257 rods stumped, 70 rods graded, 30 rods surfaced with stone, 140 rods corduroyed, 88 rods ditched, and 2 wood culverts built.

Ingram, between Concessions 4 *and* 5, *across Lots* 5 *to* 12.—One mile of new road opened up, cleared 160 rods, stumped and graded, 320 rods, ditched 20 rods, and 7 wood culverts placed.

Ingram, between Lots 6 *and* 7, *across Concessions* 1, 2, 3.—One mile of new road opened, 160 rods being grubbed, 239 rods graded, 478 rods ditched, and 1 wood culvert placed.

Lundy, between Lots 4 *and* 5, *across Concession* 3.—One-half mile of old road stumped, grubbed and boulders removed and 1½ miles of new road improved through a rough place on account of rocky ridges, 160 rods cleared, 240 rods stumped, 10 rods corduroyed, 33 rods ditched, 2 wood culverts, one 16 ft. wood bridge built.

Pense, between Lots 2 and 3, across Concessions 1, 2, 3.—One mile of old road graded and one mile of new road stumped and graded, 1 wood culvert and one 20 ft. timber bridge built.

Pense, between Concessions 3 and 4, Lots 3 to 9.—Three hundred and forty-two rods of new road cleared, 328 rods stumped, 320 rods graded, 37 rods corduroyed, and a fill of 190 cu. yds.

Pense, south Boundary, across Lots 1 to 6.—Three quarters mile of old road improved by cutting down a very steep hill and making a fill of 1,100 yds. of earth, graded 160 rods, and placed 1 wood culvert.

Robillard, between Concessions 10 and 11, across Lots 1, 2, 3.—Four hundred and eighty rods of new road stumped and graded and 10 wood culverts put in.

Robillard, between Lots 6 and 7, between Concessions 3 and 4.—Four hundred and eighty rods of new road cleared, stumped and grubbed, 20 rods ditched and 2 wood culverts built.

Robillard, between Concessions 3 and 4, Lots 1, 2, 3.—Three quarters mile of old road graded, 7 wood culverts placed, and a fill of 100 yds. of earth made.

Silver Centre Mining Roads.—Lorraine Township, from the Maiden property to the Kelley, 4 miles of old road improved, by surfacing with earth 263 rods, with gravel 76 rods, with broken stone 129 rods, ditching 110 rods, making a stone cut 11 cu. yds., an earth fill 585 cu. yds., putting in 10 wood culverts and building one 50 ft. timber bridge.

Silver Lake to Mapes-Johnston's Mines.—Mickle Tp., 4 sections on this road improved by putting gravel and broken stone on six rods, stone 4½ rods, stone and gravel on 4 rods, and in another place logs at bottom covered with stone and gravel, 1 wood culvert and one 12 ft. wooden bridge were built.

Tudhope, between Concession 1 and 2, across Lots 11 to 7, thence north.—Four hundred and sixty rods of new road cleared and 440 rods stumped and grubbed.

Tamarac Creek Road.—A beaver dam was blown out with dynamite to prevent the water washing on the road.

TEMISKAMING DIVISION.

By-laws.

Bucke By-law No. 175.—Road No. 1, between Concessions 2 and 3, Lots 9 to 11, 160 rods new road cleared 40 ft. wide. Road No. 2, across Concession 4, between Lots 10 and 11, 203 rods of new road graded and 400 rods of ditching done. Road No. 3, between Lots 10 and 11, across Concession 3, 74 rods of new road cleared, 80 rods stumped and 1 mile graded. Road No. 4, between Concessions 3 and 4, from Fleming's Corner to Haileybury, 3 miles of old road graded and 60 rods crowned with gravel. Road No. 5, between Lots 9 and 10, across Concession 3, 240 rods of new road graded and 1 wood culvert built. Road No. 6, between Lots 9 and 10, across Concession 4, 320 rods of new road graded and 20 rods ditched by making a stone cut. Road No. 7, between Concessions 3 and 4, from Fleming's Corner to Firstbrook, 1½ miles of old road graded, 60 rods crowned with earth and broken stone, 60 rods ditched and a fill of 147 cu. yds. of earth. Road No. 8, Lakeview Avenue, North Cobalt, to Lakeshore Road, 240 rods of old road graded and 96 rods crowned with gravel and broken stone. Road No. 9, Stanley St., Concession 1, 30 rods of new road cleared, stumped and graded. Road No. 10, Mill Creek Road, from

Magault's to Cross Lake Road, 160 rods of old road graded, 4 wood culverts built and an earth fill of 1,037 cu. yds. Road No. 11, between Lots 4 and 5, across Concession 5, one mile of new road cleared, stumped and graded. Road No. 12, between Lots 6 and 7, across Concessions 4 and 5, ½ mile of old road improved, 36 rods being gravelled, a fill of 75 cu. yds. of earth and 2 wood culverts placed.

Casey By-law No. 19, *Road No.* 1.—Casey, west Boundary, Concessions 1, 2, 3, one mile of old road improved, 10 rods surfaced with earth, 50 rods ditched, earth fill 175 cu. yds., 1 wood culvert built and 2 wood culverts repaired by putting on new covers. Road No. 2, Concession 6, across Lots 7 and 8, 1 mile of new road opened up, cleared 35 rods, stumped 86 rods, graded 51 rods, ditched 150 rods and 1 wood culvert placed. Road No. 4, ½ mile of new road opened up, 80 rods cleared, 40 rods stumped and ditched and 2 wood approaches to bridge re-covered. Road No. 5, between Lots 2 and 3, across Concession 1, ¾ mile of new road opened, cleared 190 rods, stumped 80 rods, graded 51 rods, 1 wood culvert and a fill of 120 cu. yds. of earth. Road No. 6, between Lots 4 and 3, across Concession 6, ½ mile of new road stumped and 15 rods of old road repaired by putting in a wood culvert and making an earth fill 122 cu. yds. Road No. 7, between Lots 6 and 7, across Concessions 2 and 3, one mile of old road repaired, 160 rods grubbed, surfaced with gravel 160 rods, with earth 12 rods and one 60 ft. timber bridge repaired by facing the piers. Road No. 8, 3rd Concession, across Lots 3 and 4, ½ mile of new road opened up, cleared, stumped and grubbed 114 rods and ditched 25 rods. Road No. 9, Concession 2, across Lots 8 and 7, ½ mile of old road repaired by putting in 1 wood culvert, ditching 185 rods and making an earth fill of 36 cu. yds. Road No. 10, between Concessions 3 and 4, across Concessions 7 to 8, ½ mile of new road worked over, cleared, stumped and grubbed 80 rods, 40 rods of outlet ditch and a bridge 160 ft. in length was covered. Road No. 11, between Concessions 5 and 6, ¼ mile of old road improved, graded 70 rods, surfaced with earth 40 rods, ditches 85 rods. Road No. 12, Concession 5, across Lots 3 and 4, 160 rods of new road graded and ditched. Road No. 13, Concession 5, Lots 5 and 6, 100 rods of new road graded and 160 rods ditched. Road No. 14, on Concession 4, from Wright's Creek east, 160 rods of new road stumped and graded, 3 wood culverts and five 16 ft. wooden bridges built. Road No. 15, between Concessions 2 and 3, from Wright's Creek east, one mile of new road worked over, 160 rods graded and 240 rods ditched. Road No. 16, between Lots 10 and 11, from Blanche River to proving line, one mile of new road cleared and 80 rods stumped. Road No. 17, Casey and Brethour Boundary, ¼ mile of new road stumped and graded and 28 rods ditched. Road No. 18, 6th Concession, across Lots 6, 5, 4, one mile of old road repaired, graded 160 rods, surfaced with earth 152 rods. Road No. 19, Concession 4, across Lots 1 to 6, ¼ mile of old road improved, surfaced with earth 100 rods, fill 355 cu. yds. earth, 1 wood culvert placed and one 28 ft. wood bridge re-covered.

Dymond By-law No. 105.—Road No. 1, the Hawkesworth property in McCamus Survey, 1 mile of new road opened, stumped and grubbed 240 rods, graded 320 rods, ditched 600 rods and 3 wood culverts placed. Road No. 2, between Lots 6 and 7, Concessions 1 to 3, ¾ mile of new road stumped and grubbed, 160 rods of old road graded, 49 rods surfaced with gravel. Road No. 3, 2nd Concession from Hudson Townline east, 2½ miles of old road improved, gravelled 131 rods, ditched 25 rods and a washout filled with stone and covered

with earth 35 rods. Road No. 4, the 3rd Concession from Hudson Townline east to Wabi River, 1¼ miles of new road opened, 235 rods cleared, 205 rods stumped, 5 rods corduroyed, 12 rods filled with stone 16 ft. x 2 ft. and 1 wood culvert built. One-half mile of old road was repaired, graded 160 rods, 1,334 cu. yds. of earth fill, 145 cu. yds. of stone fill and a bridge repaired by putting on 30 ft. of covering and 150 ft. railing. Road No. 5, 4th Concession from Hudson Townline east to Wabi River, 960 rods of old road graded and 416 rods of an earth fill made. Road No. 6, 5th Concession from Hudson Townline east to Wabi River, 120 rods of new road ditched and 80 rods cleared, stumped and graded. Road No. 7, the 6th Concession from Hudson Townline to Wabi River, one mile of new road cleared, stumped and grubbed, and one box-wood culvert put in. Road No. 8, Harley and Dymond Boundary, Lots 1 to 6, 2½ miles of old road improved, 120 rods crowned with earth, 30 rods corduroyed and a fill of 65 cu. yds. earth made. Road No. 9, Harley and Dymond Boundary, Lots 9 to 12, one mile of new road built, 160 rods graded, 60 rods ditched and 1 wood culvert placed. Road No. 10, from the Townline of Harris and Dymond west to Wabi River, on Concession 6, one mile of old road repaired, graded 80 rods, fill 341 cu. yds. of earth and 1 wood culvert placed. Road No. 11, from the Townline of Harris and Dymond west on Concession 5, Lots 11 and 12, 193 rods of new road graded, 1 wood culvert placed and a fill of 420 cu. yds. Road No. 12, from Lot 12 west to the River on Concession 4, 2 miles of old road graded and a fill of 277 cu. yds. of earth made. Road No. 13, 3rd Concession from Lot 10 west to Wabi River, 320 rods of old road graded, 1 wood culvert placed and 15 rods of outlet ditches made. Road No. 14, from Town of New Liskeard east to Harris Townline, 2 miles of old road were graded and 160 rods gravelled. Road No. 15, Hudson and Dymond Townline from Concession 4 north, 160 rods of old road graded, 1 wood culvert placed and 465 cu. yds. of earth fill made. Road No. 16, between Lots 2 and 3, Concessions 1, 2, 3, 160 rods of new road graded and ditched, 40 rods gravelled, 2 wood culverts placed and a stone wall 23 rods in length was made along a rocky sidehill making a substantial roadbed which was covered with gravel. Road No. 17, North from 4th Concession, between Lots 2 and 3, one mile of new road opened up, graded 160 rods, put in 1 wood culvert and made earth fill 1,722 cu. yds. Road No. 18, south from 3rd Concession, between Lots 4 and 5, one mile of new road opened by making a fill of 683 cu. yds. of earth. Road No. 19, from the 4th Concession north to the river road, 3 miles of old road graded and 80 rods crowned with earth. Road No. 20, south from Harley Townline, between Lots 4 and 5, 160 rods of old road graded 22 ft. wide. Road No. 21, north from the 4th Concession, between Lots 6 and 7, 3 wood and 1 tile culverts placed and 3,095 cu. yds. of an earth fill made, thus opening up 1½ miles of new road. Road No. 22, north road from New Liskeard to Harley Townline, 1,280 rods of old road graded and 35 rods gravelled. Road No. 23, sideline between Lots 10 and 11, 4 miles of old road improved by grading, putting in a new 22 ft. bridge and a new covering on an old 22-ft. bridge and making a fill of 323 cu. yds. Road No. 24, Townline of Harris and Dymond, one mile of old road worked over, 30 rods being surfaced with earth and 55 rods with gravel. Road No. 25, west road from New Liskeard to the 4th Concession, 1 mile of old road worked over, 50 yds. of earth fill made and 160 ft. guard rail put along it; 140 rods crowned with broken stone and 3 cement culverts placed.

Evanturel By-law No. 106.—Road No. 1, between Concessions 1 and 2, from Lots 2 to 6, 640 rods of old road graded and an earth fill of 75 cu. yds. made.

Road No. 2, between Concessions 2 and 3, across Lots 8 and 9, 160 rods of new road stumped, graded and ditched and one bridge repaired by putting in new abutments. Road No. 3, between Concessions 3 and 4, Lots 1 to 6, 640 rods of old road graded and 100 rods of outlet ditch constructed. Road No. 4, between Lots 6 and 7, across Concession 1, 2 miles of old road improved, side-brushed 320 rods, graded 400 rods, and surfaced with earth 100 rods. Road No. 5, between Concessions 4 and 5, across Lots 7, 8, and 9, 1 mile of old road improved by grading 160 rods, ditching 91 rods and surfacing 130 rods with earth. Road No. 6, between Lots 4 and 5, across Concessions 4, 5, 6, 2½ miles of old road improved by grading 640 rods and ditching 480 rods. Road No. 7, between Concessions 2 and 3, across Concessions 3 and 2, 1½ miles of old road improved, stumped and grubbed 152 rods, surfaced with earth 100 rods, put in 4 wood culverts and constructed 100 rods of ditch and 15 rods outlet ditch. Road No. 8, between Concessions 5 and 6, Lots 1 to 9, ½ mile of new road opened up by stumping 38 rods and ditching 160 rods, and 1 mile of old road improved by covering a 141 ft. bridge with poles, ditching 277 yds. and making an earth fill 472 cu. yds. Road No. 9, between Concessions 4 and 5, Lots 1 to 6, one mile of old road improved by crowning 155 rods with earth. Road No. 10, between Concessions 4 and 5, across Lot 11, 160 rods of new road stumped, 25 rods graded and 185 rods ditched. Road No. 11, between Lots 10 and 11, from Englehart Road, 1 mile south thence ½ mile east, 1½ miles of new road opened, cleared 160 rods, stumped 80 rods, graded 110 rods, placed 1 wood culvert and made an earth fill of 222 cu. yds.

Harley By-law No. 163.—Road No. 1, between Concessions 2 and 3, across Concessions 1, 2, 3, 130 rods of new road cleared, stumped and grubbed and 160 rods of old road graded. Road No. 2, between Lots 4 and 5, across Concessions 2 and 3, 1 mile of new road opened, 294 rods being stumped and ditched. Road No. 3, between Lots 6 and 7, across Concession 1, 320 rods of old road graded, 1 wood culvert placed and a fill of 47 cu. yds. of earth made. Road No. 4, between Concessions 2 and 3, Lots 3 to 6, 1 mile of new road opened up, cleared 210 rods and one 50 ft. wood bridge built. Road No. 6, between Concessions 3 and 4, opposite Lots 1 to 4, 160 rods of old road graded. Road No. 7, between Concessions 1 and 2, Lots 7 and 8, 1 mile of old road repaired and 1 wood culvert built. Road No. 8, between Lots 8 and 9, across Concessions 1 and 2, 2 miles of old road graded and 181 rods gravelled. Road No. 10, between Concessions 1 and 2, Lots 11 and 12, 1 mile of old road repaired, graded 158 rods, placed 2 wood culverts and ditched 25 rods. Road No. 12, between Concessions 2 and 3, opposite Lot 12, ½ mile of new road worked over, 20 rods graded and an earth fill of 570 cu. yds. Road No. 13, between Concessions 2 and 3, opposite Lots 7 and 8, ½ mile of new road worked over, 100 rods being cleared, stumped and ditched and 120 rods graded, 24 rods of old road surfaced with gravel. Road No. 14, between Concessions 3 and 4, opposite Lots 7 and 8, 31 rods of old road gravelled. Road No. 15, between Lots 4 and 5, across Concession 4, 1 mile of new road worked over, 161 rods being graded and a fill of 1,500 yds. of earth made. Road No. 16, between Concessions 4 and 5, opposite Lots 5 and 6, ¾ mile of old road improved by stumping and ditching 165 rods and gravelling 20 rods. Road No. 17, between Lots 2 and 3, across Concession 4, ½ mile of new road worked over, 100 rods being surfaced with earth, 106 rods corduroyed and ditched. Road No. 19, between Concessions 3 and 4, opposite Lots 11 and 12, 1 mile of old road improved by placing 1 wood

culvert, ditching 130 rods and making an earth fill of 400 cu. yds. Road No. 20, between Lots 6 and 7, in Concession 6, 80 rods of new road cleared, stumped and grubbed. Road No. 21, from Lot 12 west on the Townline of Hilliard and Harley, 1½ miles of old road improved, 160 rods stumped and grubbed, 160 rods graded and some small fills made and 140 rods ditched. Road No. 22, between Concessions 4 and 5, Lots 7 to 12, 1 mile of old road improved by stumping, grubbing and removing stones from 160 rods, grading 160 rods, ditching and surfacing with gravel 120 rods. Road No. 23, between Concessions 5 and 6, Lots 7 to 12, 1 mile of old road repaired, 54 rods graded and 163 rods gravelled.

Harris By-law No. 32.—Road No. 1, between Concessions 5 and 6, Lot 6, 2 wood culverts were placed. Road No. 2, 3½ miles west from south-west corner Lot 8, Concession 6, 640 rods graded, 80 rods surfaced with gravel, 92 rods with earth and 28 rods ditched; 1 wood culvert was placed, 829 yds. of an earth fill made and 1½ miles of light grading. Road No. 3, Harris and Dymond Boundary, 6th Concession, ¾ mile of old road improved, 80 rods graded, 90 rods ditched and surfaced with earth. Road No. 4, between Lots 2 and 3, Concessions 1 to 6, 3 miles of old road improved by deepening and widening 30 rods of ditch, removing boulders from 64 rods, preparing 360 rods of road-bed for gravel, 1,080 rods also graded 26 ft. wide. Part II, 800 rods of old road graded, 20 rods gravelled, 1 cement culvert placed and 960 rods of ditching done. Part III, 3 wood culverts were placed. Road No. 5, between Concessions 3 and 4, from the Dymond Boundary west, 2½ miles of old road completed, graded 640 rods, gravelled 21 rods, placed 1 cedar culvert and made a fill of 25 cu. yds. Road No. 6, between Concessions 2 and 3, east from the Dymond boundary, 160 rods of old road graded and 30 rods gravelled. Part II, removed boulders from one mile, graded 640 rods and gravelled 640 rods. Road No. 7, between Lots 4 and 5, Concessions 3 and 4, 2 miles of old road repaired, graded 560 rods, fill 640 cu. yds. earth and gravelled 20 rods. Road No. 8, between Concessions 1 and 2, 160 rods of new road graded, ditched on both sides and 1 wood culvert placed. Part II, 320 rods of new road graded, 2 wood culverts placed and a fill of 296 cu. yds. of earth made. Road No. 9, Lots 1 and 2, Concession 1, 1 mile of old road improved by grading 160 rods, repairing 1 wood culvert and cleaning out 345 rods of ditches and outlets. Road No. 10, Lakeshore Road, 2½ miles of old road improved, graded 200 rods, gravelled 60 rods and put in 6 wood culverts. Road No. 11, Harris and Casey Boundary, east from Lot 6, 1 mile of old road graded and the ditches deepened.

Hilliard By-law No. 46.—Road No. 1, Lots 1 to 6, Concession 1, 1 mile of general repairs, 50 rods gravelled and 30 rods ditched. Road No. 2, across Lots 7 and 8, Concession 1, 160 rods graded and a new 36 ft. bridge erected. Road No. 3, from Lot 1, on Concession 2, 1¼ miles of new road opened up, stumped and grubbed 320 rods, graded 240 rods, surfaced with earth 35 rods, ditched 15 rods, 1 wood culvert placed and a fill of 30 cu. yds. of earth. Road No. 4, opposite Lots 9 and 10, Concession 2, 100 rods of old road stumped and ditched. Road No. 5, across Lot 1, Concession 3, ¾ mile of a new road opened, 36 rods stumped 214 rods graded, 250 rods ditched. Road No. 6, between Lots 10 and 11, Concession 2, 1 mile of new road worked over, 130 rods stumped and grubbed, 75 rods graded, 268 rods ditched. Road No. 7, across Lots 5, 6, 7, on Concession 4, 480 rods of new road cleared 40 ft. wide. Road No. 8, river road, Lot 7, 1 mile of old road graded, 25 rods ditched and 2 wood culverts put in. Road No. 9, between Lots 2 and 3, Concession 5, 160 rods of old road graded

and 1 wood culvert placed. Road No. 10, easterly from west corner of Lot 9, Concession 5, 1 mile of old road improved by putting in 4 wood culverts and ditching 160 rods, ½ mile of new road opened, 59 rods graded, 118 rods ditched, 1 wood culvert placed and an earth fill of 507 cu. yds. Road No. 11, across Lots 1 and 2, Concession 6, 1 mile of old road improved, stumped 160 rods, graded 320 rods, 2 wood culverts placed and a fill of 200 cu. yds. made. Road No. 12, 6th Concession, Lot 8, westerly ½ mile of new road opened up, cleared 50 rods, stumped and grubbed 100 rods, ditched 124 rods. Road No. 13, between Lots 6 and 7, Concessions 5 and 6, 1½ miles of old road worked over, 140 rods graded, 158 rods ditched, 25 rods corduroyed and covered with earth. Road No. 14, north Boundary across Lots 7, 8, 9, 480 rods of old road graded, 1 wood culvert placed and one 18 ft. timber bridge repaired.

Hudson By-law No. 41.—Road No. 1, between Concessions 2 and 3, Lots 1 and 2, 1 mile of new road ditched on both sides and 200 rods graded. Road No. 2, Hudson and Dymond Boundary, across Concession 6, 1 mile of old road repaired by grading 220 rods and surfacing 90 rods with clay and gravel. Road No. 3, between Concessions 5 and 6, across Lot 1, 160 rods of old road graded and a fill of 410 cu. yds. earth made. Road No. 4, between Concessions 3 and 4, across Lot 10, ½ mile of old road repaired, 20 rods cleared and stones removed, 160 rods stumped and graded and a gravel fill 175 cu. yds. Road No. 5, between Concessions 1 and 2, across Lots 1 and 2, 80 rods crowned with broken stone. Road No. 6, between Concessions 5 and 6, across Lots 9 and 10, one mile of new road opened, 240 rods cleared, stumped and grubbed, 320 rods graded and ditched. Road No. 7, between Concessions 5 and 6, across Lots 5 and 6, one mile of old road repaired by stumping and grading 90 rods, ditching 180 rods and making an earth fill of 45 cu. yds. Road No. 8, 14 miles of Township roads improved by use of grader and gravelling, graded 3,840 rods, gravelled 528 rods, corduroyed 17 rods.

Kearns' By-law No. 108.—Road No. 1, between Concessions 1 and 2, across Lots 1 and 2, one mile of old road repaired, graded 160 rods, ditched 148 rods, earth fill 133 cu. yds. Road No. 2, between Concessions 1 and 2, Lots 11 and 12, ½ mile of new road opened, stumped and grubbed 60 rods, 1 wood culvert and one 18 ft. wood bridge built, 623 cu. yds. of earth fill. Road No. 3, between Lots 8 and 9, Concession 1, 1 mile of new road stumped, grubbed and ditched. Road No. 4, between Lots 2 and 3, across Concession 3, 1 mile of new road opened, cleared, stumped and grubbed 240 rods, ditched 480 rods, 5 wood culverts placed and 160 cu. yds. earth fill. Road No. 5, between Concessions 2 and 3, Lots 10 to 12, 1 mile of new road opened up, 106 rods surfaced with gravel, 2 box culverts placed and 153 cu. yds, of earth cut. Road No. 6, between Concessions 3 and 4, Lots 2 to 4, 2 miles of old road repaired, corduroyed 15 rods, fill 332 cu. yds. and surfaced with earth 248 rods. Road No. 7, between Lots 6 and 7, across Concession 4, 160 rods of new road graded and ditched on both sides, 2 wood culverts placed and earth fill of 245 cu. yds. Road No. 8, between Concessions 4 and 5, Lots 10 to 12, 240 rods of old road graded, 1 wood culvert placed and cut 1,972 cu. yds. Road No. 9, between Concessions 4 and 5, Lots 6 and 7, 1½ miles of old road improved, 40 rods stumped and grubbed, fill 1,198 cu. yds. and 1 wood culvert placed. Road No. 10, between Concessions 5 and 6, Lots 8 to 10, ½ mile of new road opened up, 2 wood culverts built and an earth fill of 1,375 cu. yds. Road No. 11, 36 miles of the main roads were graded by using the grader.

TRUNK ROADS.

Bridgeland Trunk Road.—The work on this road this year was well under way when orders were received to stop. The work done was on the approved location which shortened the distance from Dunn's Valley to Thessalon by seven miles. The new location is 4½ miles long, 3 miles of this have been cleared and logged to a width of 30 ft., and for the most part stumped. The work has been well and carefully done.

Black Sturgeon Narrows to Mellick Bay Trunk Road.—Between Lots 1 and 2, Concession 2, Lot 2, Concession 1, from F.M. 66 and south part of F.M. 66 in Township of Mellick, through Lots 13, 14, 15, Concession 8, Township of Jaffray, 2½ miles of old road put in very good shape and 1½ miles of new road constructed. The work on the old road was as follows, cleared 2½ miles, stumped and grubbed two miles, graded 1½ miles, crowned with gravel and clay 1½ miles, ditched 1½ miles, 4 small off-take ditches, 112 rods of corduroy laid and covered with clay, 16 wood culverts placed, and repaired the approaches of the Black Sturgeon Lake Bridge. On the new road 1½ miles cleared, stumped, graded, surfaced with gravel and clay, ditched with four off-take ditches, 75 rods corduroyed and covered with clay, 4 wood culverts and one 22 ft. bridge built.

Coniston-Garson Trunk Road.—From Lot 2 on the line between Concessions 2 and 3 Neelon, to the north-west corner of Lot 4, Concession 1, Garson, 4¾ miles of new road constructed, the following work being performed, cleared 1,000 rods 66 ft., stumped and grubbed 1,200 rods, graded and surfaced with earth 1,520 rods, cut 900 cu. yds. of earth, fill 200 cu. yds. of earth and stone, ditching 3,040 rods, 3 concrete, 3 stone and 40 cedar culverts built, one 20 ft. concrete steel bridge with concrete piers and floor and one 12 ft. cedar bridge were erected. This was one of the best works in the northern part of the Province. One rock ridge was blasted out and a diversion made in the Burnt River to save two railway crossings and one bridge. The road is almost in a direct line from Coniston to Garson.

Elk Lake-Gowganda Trunk Road.—The work on this well-known trunk road was done at the following places, at mile 7, a new bridge 26 ft. in length and 12 ft. wide was built; at mile 7½, 1 culvert was placed and 2 small rock fills, one 25 cu. yds., the other 12 yds., both of which were covered with gravel; at 8½ miles, 1 culvert was placed and 2 small rock fills amounting to 43 cu. yds. were made; at 9½ miles corduroy repaired by putting in 3 new stringers and new logs; at 10 miles, culvert was placed and 2 small fills of rock amounting to 15 cu. yds.; at mile 11½, a small culvert placed and 40 cu. yds. of fill; at mile 13, culvert and small fills; at mile 13¾, culvert and small fills; mile 14½, culvert and broken stone fill, also 2 new stringers and 15 new logs put in the bridge; at mile 20, removed a broken bridge and filled in gulley with 128 cu. yds. of stone and covered it with gravel; mile 21, repaired a bridge and put in new culvert; mile 22, repaired a culvert and put in new bridge with 4 heavy stringers, covered with timber 14 ft. long, a fill of 100 cu. yds. of rock; mile 22½, cleaned out a beaver dam and repaired a bridge; at mile 23½, removed the stringers from under the corduroy and placed the logs on the ground and covered them with gravel; all the fallen trees along this road between Elk Lake and Gowganda were removed, the sides of all the hills were well built up and the stones placed by hand.

Lee-Valley Espanola Trunk Road.—From Lot 3, Concession 4, Hallam, across Lots 4, 5, 6, Concession 4, 1½ miles of new road completed, 480 rods being

cleared, 80 rods stumped and grubbed, 480 rods graded, surfaced with earth and ditched on both sides and 2 new iron culverts placed. This completes the road commenced last year, and a very level grade has been obtained along the whole road.

Haileybury-Montreal River Trunk Road.—Between Concessions 4 and 5, in Barr Township, east of the Montreal River, 3½ miles of new road opened up, the work being through a bed of boulders most of the distance, 1,120 rods cleared, 800 rods stumped and boulders removed, 39 rods corduroyed, 199 cu. yds. of cut and fill and the boulders removed the entire distance.

Lost Lake and Loring Trunk Road.—Lot 21, Concession 5, from Mowat's Station, 3 miles of old road improved and ½ mile of new road constructed, the work was cutting sides of the road 900 rods, stumping 900 rods, deviating around bad hills, and blasting, grading, and surfacing with earth 400 rods, corduroying 38 rods and covering it with soil, ditching 100 rods, putting in 6 wood culverts and building one 50 ft. wood float bridge.

Manitoulin Island Trunk Road.—Lots 16 to 22, Concession 12, Sheguiandah. Ten Mile Point Road, 440 rods of old road crowned with gravel and 1 wood culvert placed. Lot 8, Concession 7, to Lot 19, Concession 7, Billings, 3¼ miles of new road opened, about half this road was very stony and rough to get ready for grading, cleared 500 rods, stumped and grubbed 200 rods, graded and crowned with stone and gravel 3½ miles, rock cut 150 rods, fill 125 yds., earth cut 2,000 yds., fill 2,500 yds., gravelling 155 yds. long, placed in fill, 13 rock culverts built, and 310 rods ditched. Sheguiandah to Little Current, Howland Township, 100 rods of old road graded, 210 rods crowned with gravel, 2 concrete culverts repaired, and an earth fill of 100 yds. made.

May and Salter Trunk Road.—From Sec. 24, Salter, north and west to Sec. 5, through Concessions 1, 2, 3. This road is seven miles in length and four miles improved by general repairs, 500 rods sidebrushed 10 ft. wide, 1,600 rods graded and 640 rods gravelled.

Moss Township Trunk Road.—One and one-half miles of new road cleared, stumped and grubbed, 50 rods corduroyed, 40 rods ditched and 6 wood culverts placed.

Ottertail Lake Trunk Road.—This road extends from the village of Rydal Bank westerly for 1 mile along the high bank of the Ottertail Lake. The work was done on the old location with the exception of one diversion of some 150 yds. to avoid a bad grade. This road has been graded and gravelled and the brush cleared from the sides, 8 metal culverts have been placed, half of them with concrete ends, several bad grades have been reduced materially, and the road is now, with the exception of two spots, in first-class condition. These are diversions above mentioned, which are still to be graded and gravelled and a small amount of cutting on one of the grades. Owing to orders received it was necessary to close down this work before completing these two details.

Sesikineka to Wolfe Lake Winter Road.—On Lot 9, Concession 1, north of the line between Lots 8 and 9, a distance of 1 mile, thence in a north-easterly direction to the blind line on Lot 5, Concession 5, Maisonville Township, five miles of a first-class winter road has been made with easy grades and very gradual curves through a rocky and mountainous district, pitch holes are filled and levelled up, 5 miles cleared 20 ft. wide and stumped and grubbed 10 ft. wide, 3 timber bridges 16 ft., 30 ft. and 35 ft. in length respectively have been built, and corduroying 200 rods on sidehills.

Sudbury-Soo Trunk Road.—Webbwood-Espanola Section, Hallam Tp., 1 mile of old road improved by repairing several holes in the road by making earth fills and one large rock fill 800 cu. yds. and a culvert where the road had washed out made rock was hauled a distance of 80 rods, mostly large boulders, most of which were placed by hand to form a wall at the side of the road. Victoria Mines to Worthington Section, this Section of the road has been completed, the mile immediately west of Victoria Mines has been surfaced with tailings from the waste pile at the mine, the balance has been covered with gravel; 1¾ miles built and graded, a mile immediately west of Worthington surfaced, 560 rods graded, 10 metal culverts placed, 21 culverts have had concrete ends placed on them. Espanola Section, first, that section of the trunk road between Espanola Village and Espanola Station on the C.P.R. 1 mile in length has been regraded, drained and gravelled, 4 metal culverts have been placed with concrete ends, a hill on this section has also been cut down considerably, greatly improving the grade. Second, a new road 1¾ miles in length has been built connecting the trunk road with the Espanola section, 1½ miles graded, 40 rods gravelled, 18 rods corduroyed, 4 metal culverts have been placed; work on this section had to be suspended about the middle of August, otherwise it would have been gravelled throughout as intended. This new road takes the place of an old one, which for various reasons was incapable of improvement. For some distance the road ran along the right-of-way of the Algoma Eastern Railway, crossing it several times. As it was hemmed in by rocky cliffs it was impossible to remove it from the right-of-way so as to avoid the numerous crossings, consequently the new location was decided upon and is now used entirely by the traffic. Blind River, Algoma Section: The distance between Blind River and Algoma is, approximately, eight miles. Of this somewhat less than three miles adjoining Blind River was constructed five years ago. Of the five miles to have been constructed this year three have been built, commencing at Algoma two miles have been built, of which 1½ miles have been gravelled. Proceeding west there is a gap of two miles, of which half has been cleared, but otherwise unbuilt. Between this unfinished portion and the previously completed part one mile has been built and half of it gravelled. In addition some repairs have been made on the part previously constructed. Corrugated metal culverts have been installed on the three miles built this year and culverts are on the ground ready to install on the remaining five miles. The camp outfits in use have been stored at Algoma and Blind River. The stables and buildings are in position for a resumption of the work. Coppercliff-Naughton Section, 2½ miles west from the C.P.R. Station, Coppercliff, has been graded with the grader and gravelled.

Vermilion and Quibell Trunk Road.—Lots 4 and 5, Concession 5, Langton, 1½ miles of old road improved in a satisfactory manner when orders were received to close down. The location of the road has been changed put on the line, cleared 1½ miles, stumped and grubbed 1 mile, graded and gravelled ½ mile, 94 rods corduroyed and covered with earth, 5 off-take ditches constructed, 4 wood culverts placed, and 1 18 ft. wooden bridge built. Part II., between Lots 8 and 9, Concessions 3, 4, 5, Wabigoon, 3½ miles of new road has been constructed, nearly all graded with the grader, a large amount of rock was removed from the roadbed; the 3½ miles cleared, stumped and graded and surfaced with clay, 2 miles ditched and 4 off-take ditches constructed, some corduroy laid and covered with gravel, 8 wood culverts placed and four 20 ft. timber bridges constructed.

STATEMENT OF EXPENDITURE

ON

COLONIZATION ROADS AND BRIDGES

IN THE YEAR 1914

SUMMARY OF EXPENDITURE ON COLONIZATION ROADS IN THE YEAR 1914.

Name of Road.	Expenditure.
Aberdeen, Cons. 2 and 3 West from East Boundary	$300 00
Aberdeen, Lots 10 and 11, Con. 4	300 00
Aberdeen Additional Road East from West Boundary	300 00
Ansonia Road West from Townline Lefroy and Thessalon	275 00
Aubrey Township Roads	697 37
Assiginac Township Roads:—	
Coe Section	130 00
Sims Section	150 00
Bennett Section	150 00
McMullen Section	149 99
Assiginac, 16th Con. on Hill	100 00
Assiginac and Sheguiandah Townline	98 98
Assiginac and Tekummah Townline 8th Con., 5th Sideroad	100 00
Allan Township, Cons. 4 to 8	150 00
Alexander Portage Road	200 00
Basswood Lake Road	300 00
Birch Lake Road	400 00
Bright, Con. 5. West from Lot 3	348 63
Bright, Con. 5, East from North Boundary	348 40
Baldwin Road	150 00
Barrie Island Roads:—	
Cole Section	148 16
Lattie Section	149 99
Billings Township Roads:—	
Foster Section	250 00
Edie Section	150 00
Buck Section	100 00
Richards Section	100 00
Tustian Section	100 00
Billings and Carnarvon Townline	150 00
Bidwell Township Roads:—	
Ferguson Section	150 00
Sommerville Section	200 00
Hembruff Section	150 00
Burpee Township Roads:—	
Campbell Section	199 99
Keown Section	150 00
McKinlay Section	75 00
Morden Section	149 98
Bailey Section	200 00
Harper Section	218 10
Batchewana Road	500 00
Batchewana Bay Road	298 00
Balfour Township Roads:—	
Lot 4 to Boundary of Morgan	500 00
Morgan Road	500 00
Obumsiwim Section	783 19
Guse Section	200 00
Broder Township Roads:—	
Old Long Lake Road	375 00
Long Lake Road to Tremblay's Corners	347 50
MacFarlane Lake Road	350 00
Lots 6 and 7, Con. 4	200 00
Lot 12, Con. 4	399 85
Lot 8, Con. 4	150 00
Deloges Section	150 00

Name of Road.	Expenditure.
Bellevue Station and Goulais Bay Settlement Road:—	
1st Section, East End	1,496 50
2nd Section	1,000 00
3rd Section to River	1,000 00
4th Section, River and Bellevue Station	498 00
Caribou Lake Road	299 93
Cobden Township Roads	300 00
Cuthbertson, Con. 7	400 00
Cuthbertson, Con. 6	349 48
Cuthbertson, North of Con. 6	299 55
Conmee Township Roads:—	
School Section No. 1	699 80
School Section No. 2	697 23
Campbell, 25th Sideline	100 00
Campbell, 20th Sideroad	50 00
Campbell and Carnarvon Townline, Cons. 1 to 16	150 00
Carnarvon, 4th Con. past Hopkins	150 00
Cockburn Island Road	200 00
Colin Campbell's to bridge	150 00
Capreol Township Roads:—	
Con 2, Lot 5	198 75
Con. 3, Lots 4 and 5	100 00
Lines 10 and 11, Cons. 2 and 3	400 00
Lots 10 and 11, Con. 3	400 00
Lots 6 to 8, Capreol & Garson	499 50
Con. 1, Lots 10 and 11	100 00
Capreol and Hanmer Road	100 00
Con. 6, Garson to Capreol Boundary	200 00
Copper Cliff and Creighton Road	556 45
Dean Lake to Thompson's Bridge	399 92
Dean Lake to Patton Road	299 95
Desbarats Lake Road	300 00
Diamond Lake Road	300 00
Dawson Road Township Road	800 00
Dorion Township Roads	2,993 47
Dawson Township Road	300 00
Eton Township Roads	800 00
Espanola Station Road	150 00
Fossil Hill Road	149 05
Fairbank and Creighton Township Roads	1,000 00
Galbraith, Lot 6, Con. 2	300 00
Galbraith, Cons. 1 and 2	200 00
Galbraith, Broad's Road	300 00
Galbraith Township, Lot 8—Destroying Beaver Dam	20 00
Glen Otter Road	300 00
Gillies Township Roads	898 45
Gold Rock Road	400 00
Gordon, East Bluff	100 00
Gordon Township, Sand Hill	300 00
Gore Bay to Hope's Hill	150 00
Gore Bay to Ice Lake	200 00
Government Road, Cons. A. and B.	200 00
Gorham, between Lots 8 and 9, Cons. 1 to 6	1,498 50
Gorham, between Lots 6 and 7, Cons. 1 to 6	1,000 00
Gorham, between Lots 12 and 13, Cons. 2 to 4	500 00
Gorham, between Cons. 3 and 4, Lots 14 to 18	999 85
Gorham, between Cons. 4 and 5, Lots 14 to 18	1,000 00
Gorham, between Cons. 5 and 6, across Lots 14 to 18	924 05
Goulais Bay Settlement Road	599 60
Goulais Bay Mission Road	500 00
Goulais Bay Road Repairs	75 87
Hallam, Cons. 3 and 1	600 00

Name of Road.	Expenditure.
Hilton, Cons. 11 and 12	300 00
Hincks Location, Con. 6	300 00
Hincks Location, Con. 5	300 00
Hartman Township Roads	499 90
Howland Municipality Roads:—	
Chisholm Section	150 00
Ferguson Section	150 00
Stringer Section (R)	150 00
Taylor Section	150 00
Stringer Section (J. L.)	200 00
Wm. Rowe Section	99 66
Arthur Rowe Section	99 00
Hagar Township Roads:—	
Cons. 5 and 6	100 00
Lot 9, Cons. 2 and 3	197 75
Lots 6 and 7, Con. 5	150 00
Lots 10 and 12, Cons. 5 and 6	398 98
Lots 8 and 9, Con. 6	150 00
Lots 10 and 11, Cons. 4 and 5	300 00
Cons. 2 and 3, West Townline	200 00
Lots 12 and 13, South to Appleby	197 50
Cons. 1 and 2 to bridge	299 99
Hanmer Township Roads:—	
Lots 4 and 5, Con. 3	200 00
Lots 6 to 12, Con. 2	400 00
Lots 1 to 4, Con. 4	200 00
Lots 1 to 3, Con. 3	499 65
Lots 8 to 12, Con 3	498 55
Lots 6 and 7, Cons. 4 and 5	200 00
Hanmer and Rayside Boundary:—	
West End	500 00
East End	500 00
Haviland Sideroad in Gibbs	199 25
Iron Bridge and Patton Road	300 00
Iron Bridge and Bellingham Road	700 00
Ignace Township Roads	500 00
Indian Point Bridge, East	199 00
Johnston, Lot 4, Cons. 4 and 5	400 00
Johnston, Boyer Road	100 00
Kagawong, Con. 14 and Range A.	99 97
Kagawong to Ice Lake	199 99
Killarney to Collin's Inlet	290 39
Kerr Road Washout	996 17
Lewellyn Beach Road	400 00
Lefroy and Plummer Additional Townline	299 00
Lefroy, Cons. 5 and 6 Lots 31 and 32	300 00
Lewis Township Roads	400 00
Lybester Township Roads	896 25
Lawson Township, Joyces East	399 86
Long Bay to Ice Lake	107 10
Long Bay to Hope's Hill	299 50
Lorne Township Road	147 50
Louise Township Roads	300 00
Little Current to Honora	149 00
Levi Walker's to Lake	499 25
Lumsden Township Roads:—	
Lot 7, Con. 1	100 00
Lots 6 and 8, Con. 2	300 00
Lot 6, Con. 2	300 00
Lot 2, Con. 5	99 25
Lots 1 and 2, Con. 1	200 00

Name of Road.	Expenditure.
Marsh River Road	299 75
May, Cons. 4, Lots 10 and 11	300 00
May, Cons. 1 and 2, Lots 6 to 12	300 00
Milltown Road West	300 00
McDonald, Alton's Hill	200 00
McDonald Road, Section 20	350 00
McPhee Valley Road	400 00
Marks Township Roads	797 45
Machin Township Roads	499 99
Melgund Township Roads	800 00
Mutrie Township Roads	598 49
Manitou Lake Road.	147 06
Manitowaning Road to Reserve	144 00
Merritt Township East of Mill	150 00
Merritt from Louthier	150 00
Mills Township, Lees to Bowsers	149 98
McAuley's Sideroad, Assiginac	100 00
McCullough's to Sandfield Mills	100 00
Michipicoten Roads	800 00
Nairn Township Roads	150 00
Nepigon Township Roads	1,000 00
Neelon, Con. 6, Lots 9 and 10	738 32
O'Connor Township Roads:—	
Section 2	500 00
Section 2	500 00
Oliver Township Roads	998 00
"P" Line Hill	499 45
"P" Line to Wharf	500 00
Plummer Road, Con. 3	250 00
Plummer, Cons. 3 and 4	300 00
Plummer, Con. 6	298 25
Plummer, McIver Road	284 72
Plummer, Con. 5, Lot 3	300 00
Plummer, Additional Road	400 00
Parkinson and Mississauga River Road	299 99
Paipoonge Township Roads	900 00
Pearson Township Roads	850 00
Pervale to Kagawong	100 00
Pike Sideroad towards Manitowaning	149 65
Providence Bay to Newhouse	199 12
Poplar to Gore Bay	199 07
Prince, Sections 34 and 35	291 34
Prince Kay-McLean Road	498 24
Prince, Wilson's Road	500 00
Rydal Bank, North	399 50
Robinson Township Roads:—	
Kemp Section.	299 79
Rumley Section	250 00
Kemp Section	325 00
Rockville Road to Green Bay	150 00
Rockville to Carnarvon	99 95
Rayside Township Roads	750 00
Salter, Broken Front, East from Lot 5	300 00
Sheddon and Victoria Townline	247 95
Spanish Road, North	275 00
Shakespears Con 1 and Baldwin Township	800 00
Striker Township Roads	291 75
Stobie Road.	300 00
St. Joseph Island, Cons. Q. and R. to A. Line	399 50
Scoble Township Roads	898 90
Strange Township Roads	500 00
Sandford Township Roads	700 00

Name of Road.	Expenditure.
Sandfield Township Roads:—	
Moody Section. . .	100 00
Tann Section . .	150 00
Hare Section . .	150 00
Leiscombe Section. . .	149 98
Young Section	350 00
Silver Water to Williams	149 99
Slash School South on Townline	99 87
South Bay Mouth to the 5th Sideroad	150 00
Schreiber to Newman's Lake	500 00
Schreiber to Lake Superior	300 00
Tarbutt Additional, Con. 6 Lots 7 and 11	300 00
Thessalon, Sections 30 and 31	299 95
Thessalon, Main Road	300 00
Thessalon, between Sections 24 and 25 also 19 and 30	349 60
Thompson, Section 7	350 00
Tunnel Bridge Road	600 00
Temple Township Roads	784 52
Tehkummah Township Roads:—	
Orr Section .	200 00
Coltes Section . .	100 00
Little Section . .	100 00
Martin Section . .	100 00
Hall Section. . .	200 00
Russell Section . .	150 00
McMurray Section . .	100 00
Murray Section . .	99 90
Leeson Section . .	99 39
Sproat Section. . .	100 00
Umbach Township Roads	499 66
Victoria, North Lake to Cedar Lake	400 00
Victoria. Section 33	399 99
Vankoughnet, Section 20	399 79
Vankoughnet between Sections 34 and 35	299 78
Walford Village Road	200 00
Wells Township, Main Road	600 00
Wells, Con. 3, Lots 5 and 8	400 00
White Road Aberdeen	299 75
Wabigoon Township Roads	998 93
Wainwright Township Roads	900 00
West Bay, Cons 10 and 12	98 50
Ware, between Lots 12 and 13, Cons. 4, 5 and 6	992 00
Ware, between Cons. 4 and 5 across Lots 1 to 10	1,345 55
Ware, between Cons. 3 and 4 across Lots 11 to 18	1,250 00
Ware and Gorham Boundary across Cons. 4 5 and 6	1,399 45
Ware and Gorham Boundary North from the Red River Road	750 00
Waters Township Roads—	
Luttimas Section. . .	299 74
Gaudreault Section . .	300 00
Kalis Section . .	100 00
Robinson Section . .	300 00
Zealand Township Roads	797 00

By-Laws.

Alberton By-law No. C.	$1,000 00
Assiginac By-law No. 360	1,289 94
Billings By-law No. 216	700 00
Balfour By-law No. 36	1,000 00
Blezard By-law No. 68	150 00
Blue By-law No. 12	1,210 00
Conmee By-law No. 13	750 00
Carnarvon By-law No. 282	1,000 00
Cockburn Island By-law No. 86	200 00
Chapple By-law No. 172	2,997 51

Name of Road.	Expenditure.
Day and Bright Additional By-law No. 4	65 00
Dilke By-law No. 57	706 28
Emo By-law No. 171	2,825 00
Gordon By-law No. 125	1,200 00
Hilton By-law No. 357	700 00
Howland By-law No. 86	900 00
Jocelyn By-law No. 268	500 00
Johnson By-law No. A44	299 00
Jaffray By-law No. 53	497 30
Korah By-law No. 118	2,990 00
Laird By-law No. 99	400 00
Lavallee By-law No. 125	2,975 48
Morley and Patullo By-law No. 116	2,334 43
McDonald, Meredith and Aberdeen Additional By-law No. 115	750 00
McKim By-law No. 133	508 82
Neebing By-law No. 327	4,986 85
Neelon and Garson By-law No. 77	1,250 00
O'Connor By-law No. 75	128 44
Oliver By-law No. 154	2,350 00
Paipoonge By-law No. 128	3,025 00
Plummer Additional By-law No. 132	650 00
Prince By-law No. 47	500 68
Rayside By-law No. 118	600 00
Sandfield By-law No. 195	300 00
Shuniah By-law No. 391	5,012 40
St. Joseph By-law No. 406	900 00
Tarbutt and Tarbutt Additional By-law No. 8	300 00
Thessalon By-law No. 14	250 00
Tehkummah By-law No. 206	750 00
Tarentorus By-law No. 137	1,250 00
Worthington By-law No. 57	675 00
Trunk Roads.	
Lee-Valley and Espanola Trunk Road	551 93
Vermilion-Quibell Trunk Road	3,375 25
Manitoulin Island Trunk Roads:—	
Gore Bay to Little Current	4,010 38
Sheguiandah to Little Current	499 30
Manitowaning to Sheguiandah	496 70
Sudbury-Soo Trunk Roads:—	
Webbwood-Espanola Section	720 55
Victoria Mines to Worthington	5,120 75
Espanola Section	3,866 98
Blind River and Algoma Mills	9,274 87
Copper Cliff—Naughton Section	1,098 67
Espanola-Lee Valley Trunk Road	1,499 34
Bridgeland Trunk Road	929 28
Ottertail Lake Trunk Road	1,339 49
May and Salter Trunk Road	801 00
Coniston-Garson Trunk Road	8,541 47
Black Sturgeon Narrows to Mellick Bay	999 74
Moss Township Trunk Road	827 20
J.J. Lang, Services as Engineer, Trunk Roads	576 87
Surveys and Locations of Roads	6 10
Inspection (North Divison)	5,160 55
T. & N. O., Rent of Land for Storehouse	15 00
Broken Front Salter, Balance 1913	26 00
Kars Road, balance 1913	142 35
Shakespeare Centre Line, balance 1913	25 85
Strange Township, balance 1913	382 21
Wabigoon, balance 1913	79 72
Wainwright, balance 1913	51 18
Burris Road, balance 1912 (Cuthbertson)	200 00
South Porcupine, balance 1913 (Crawford)	56 15
Lepage Account, Nordrum Road, balance 1909	50 00

Name of Road.	Expenditure.
A Shaw, Bridgeland Road Contract 1912	125 00
W. Stull, Sudbury-Soo, balance 1912	32 50
J. McKay Hunt, Daws on Road, balance 1908	67 00
Billings By-law 312, balance 1913	600 00
Blue By-law No. 47, balance 1913	703 12
Paipoonge By-law No. 112, balance 1913	2,236 73
Worthington By-law No. 47, balance 1913	634 38
McDonald, Meredith and Aberdeen By-law No. 109, balance 1913	634 29
Grant to Korah Township, 1913	1,000 00
Grant to Shuniah Municipality, 1913	500 00
Balfour and Morgan Road, balance 1913.	99 81
Rydal Bank, balance 1913	9 50
Michipicoten Mining Road, balance 1913	188 51
Broder Township Road, balance 1913	49 80
Little Current and Manitowaning Road, balance 1913	4 00
Road Making Machinery	341 26
Repair Bridge, Cons. 2 and 3, Lot 8, Burris	299 94
	$210,340 81

WEST DIVISION.

Ahmic Harbor Road	$300 00
Alsace, Con. 2, Lots 10 to 14	500 00
Armour, Con. 3, Lot 12 North to Con. 5	150 00
Axe Lake Road	200 00
Baysville-Bracebridge Road.	500 00
Baysville Road, Lot 16, Con. 0, Brunel	299 41
Brunel Road North of Port Sydney	298 70
Bull's Run Hill on Huntsville Dorset Road	500 00
Balsam Road, Con. 3 and North	299 56
Bellow Hill, Cons. 5 and 6, Nipissing	596 83
Bethune, Con. 12, Lots 17 to 25	400 00
Black Road Station to Alexander Vankoughnet's	497 88
Brown Swamp, Nipissing and Restoule Road	299 35
Byng Inlet to C.P.R. Station, Wallbridge	450 00
Bury Road from Townline Lindsay and St. Edmunds	1,000 00
Chaffey, between Lots 10 and 11, Cons. 12 to 14	200 00
Chaffey, 25th Sideroad, Cons. 11 and 12, East	200 00
Carling, Blind Line, Cons. 11 and 12	400 00
Chapman 10th Sideroad	400 00
Christie Road North of Edgington	400 00
Clay Hill Repairs	399 51
Commanda Lake Road, Patterson	400 00
Commanda and Trout Creek Road, Gurd	300 00
Coldwater Road, Cons. 12 and 13	200 00
Distress River Road, Lots 20 and 25	399 49
Distress Road from Boundary of Chapman and Strong West	200 00
East River Hills, West Road, Chaffey	196 62
East Road from Nanitoumeba Dam to Waubaumic Junction	500 00
East Road, Spence	375 50
Franklin Peninsula to Lake of Bays	299 46
Fraserburg-Bracebridge Road	300 00
Fish Lake Road	100 00
Ferguson, Lot 1, Con. 4	300 00
Ferguson & McKellar Boundary, Lot 1	300 00
German Road, Con. 12, Lots 17 to 2, Mills	194 00
Great North Road between Commanda and Golden Valley	699 97
Gurd between Cons. 4 and 5	397 69
Gurd and Machar Boundary Lots 10 to 15	198 40
Huntsville Road to Hiram Fetterley's	500 00
Himsworth, 20th sideroad, Cons. 16 and 17	400 00
Jerusalem Road, between Cons. 12 and 13	499 56
Joly, Cons. 10 and 11	388 94
Kearney and Orange Valley Road	400 00
Lake Siding to Deer Lake	300 00
Loring and Arnestine Road	400 00

Name of Road.	Expenditure.
Lount, 10th sideline from Eagle Lake	299 25
Muskoka Road North of Utterson	200 00
Mortimer's Point to Port Carling	299 95
Machar, 10th Sideroad	200 00
Mill Lake Road, McDougall	200 00
Mills, Lot 24, Con. 8 to Lot 22, Con. 7	398 40
McCoy Hill Deviation	200 00
McMurrich 20th Sideline	200 00
McMurrich, 5th sideroad, G.T.R. to Doe Lake	300 00
Medonte, Lots 20 and 21	400 00
Medonte, Cons. 10 and 11	500 00
Muskoka Road North on 14th Con., Orillia	200 00
North Cardwell Road Deviation Lot 35 Con. 12	150 00
Nipissing from Lot 30, Con. 3	400 00
Nipissing Road, Monteith, Lots 24 to 32	400 00
Nipissing Road in Chapman	500 00
Nipissing, 10th sideroad, Cons. 4 to 6	300 00
North Himsworth, East Boundary, Cons. 13 and 14	400 00
Port Severn Road in Baxter	100 00
Parry Sound Road West from Redfern's	200 00
Perry Sideroad, 31, Cons. 3 to 9	299 31
Peninsula and Stanley House Road	400 00
Proctor's Hill, 15th sideroad in Strong	200 00
Port Severn Road in Matchedash	100 00
Orillia, Con. 4 from C.P.R.	200 00
Orillia, Con. 7 from North River	299 27
Ora, Con. 12	300 00
Rondville to Fox Point	49 40
Restoule Lake, North End	200 00
Round Lake Road	399 24
Ryerson, Con. 10, Lot 24	400 00
Severn Bridge Road North	399 44
Skeleton Hill, Parry Sound Road	200 00
South Himsworth, Con. 8, Lot 6	248 50
South Himsworth, 15th sideroad, Cons. 12 and 13	400 00
South Himsworth, cut Hill, Cons. 8 and 9, Lot 15	300 00
Strong, 10th sideroad, Cons. 11 and 12	400 00
Strong, Cons. 8 and 9, Eastward	396 04
Strong, 20th sideroad, Cons. 10 to 14	250 00
Strong, 5th sideroad, Cons. 7 and 8	250 00
Sarawak Township, Main Road	500 00
Tay, 2nd Con. Lot 95	100 00
Wood Lake Road	300 00
Westphalia Road	398 84
White Stone and Deer Lake Station Road	242 90

By-Laws.

Albermarle By-law No. 516	$1,000 00
Amabel By-law No. 150	1,500 00
Chapman By-law No. 6	799 69
Eastnor By-law No. 970	1,178 09
Hepworth By-law No. 16	100 00
Joly By-law No. 141	100 00
Keppel By-law No. 11	1,999 63
Lindsay By-law No. 205	1,250 00
Machar By-law No. 476	350 00
Matchedash By-law No. 165	398 55
Medonte By-law No. 524	1,402 50
Medora and Wood By-law No. 274	1,000 00
Monck By-law No. 403	1,113 25
Mulmur By-law No. A.	106 70
Muskoka By-law No. 268	600 00
McLean and Ridout By-law No. 371	400 00
Orillia By-law No. 906	1,780 00
Oro By-law No. 420	500 00

Name of Road.	Expenditure.
Perry By-law No. 124	100 00
St. Edmunds By-law No. 156	600 00
Stisted By-law No. 200	200 00
Strong By-law No. 342	299 81
Sundridge By-law No. 211	300 00
Sunnidale By-law No. 431	1,626 33
Tay By-law No. 596	2,480 00
Tiny-By-law No. 522	1,739 69
Lost Lake and Loring Trunk Road	1,118 58
Inspection (West Division)	1,909 80
Lorimer Lake Road, Balance 1913	25 02
C.P.R. to Byng Inlet, Balance 1913	25 00
Perry By-law No. 115, Balance 1913	278 75
Chapman, 10th Sideroad, Balance 1913	10 00
Loring and Restoule Road, Balance 1913	6 75
Orillia Road, Con. 2, Balance 1913	471 70
Orillia-Dalton Road, Balance 1913	20 06
	$56,411 31

EAST DIVISION.

Addington and Harlow Road	$278 70
Arden and Parham Road	400 00
Ardoch and Clarendon Road	800 00
Airy Township Roads:—	
Con. 4, Lot 19	300 00
Con. 2, Lot 11	297 12
Con. 2, North	100 00
Con. 2, Lot 23	100 00
Lot 15, Con. 2, East	200 00
Anstruther Township Roads	200 60
Alice 10th Con.:—	
Ryan Section	500 00
Streetsman Section	499 86
Alice Township Road	207 00
Admaston Township Roads:—	
Pucker Street Road	200 09
Shamrock and Quilty Road	100 00
Whalan Settlement Road	149 97
McDougal Road	150 00
Renfrew and Douglas Road	200 00
Appleby, Lots 4 and 5 across Cons. 2 and 3	300 00
Appleby and Hagar Boundary, Lots 1 to 5	300 00
Anson and Hinden Township Roads	300 00
Battersea and Keelerville Road from Warts Corner	1,000 00
Bedford and Opinicon Road from Bedford and Opinicon Station	400 00
Bedford and Opinicon Road between Bedford Mills and Opinicon Lake	400 00
Bancroft and Hermon Road	200 00
Bancroft and Coe Hill in Faraday	200 00
Bangor, Wicklow and McClure Township Roads:—	
Wicklow Township	100 00
McClure Township	99 85
Bells Rapids Road in Bangor	200 00
Bessemer and Hermon Road in Mayo	200 00
Bessemer and Long Lake Road in Mayo	199 65
Bronson, Fill York Branch	239 26
Burgess Mine Road in Carlow	250 00
Beckwith, 9th Line	499 14
Bellamy Road	200 00
Bedford Mills Road	150 00

Name of Road.	Expenditure.
Bonfield Township Roads:—	
Con. 9, Lot 32	199 25
Con. 6, Lot 10	199 44
Sideroad 15, Con. 8, North	200 00
Sideroad 15, Con. 8, South	150 00
Con. 8 from Lot 5	300 00
Con. 2, Lot 35	300 00
Con. 2, Lot 23	200 00
Lot 29, Con. 2	150 00
Con. 3, Lots 30 and 31	150 00
Boulter Township Roads:—	
Lots 11 and 12, Cons. 3 and 4	200 00
Lot 10, Con. 18	200 00
Sideline 25, Con. 8	200 00
Belmont Township Roads:—	
Anderson Section (Round Lake Road)	100 00
Stoney Lake Road	149 22
Cardova Road	100 00
Burleigh Township Roads	1,000 00
Buckhorn Road:—	
Windover Section	130 00
Guthrie Section	150 00
Irwin Section	147 50
Freeborn Section	50 00
Beachburg Road:—	
Burns Section	1,000 00
Delahay Section	200 00
Cotnam Section	300 00
Bromley Townline	204 05
Black Creek Road:—	
Sack Section	150 00
Keope Section	150 00
Bromley Township Roads	300 00
Bromley and Westmeath Townline	1,000 00
Bagot and Blythfield Township Roads:—	
Ashdah and Calabogie Road	200 00
Calabogie and Lanark	100 00
Stewart Section	100 00
Townline McNab and Bagot	75 00
McHugh Settlement Road	75 00
Burnstown and Springtown	150 00
Warren Road, Bagot	100 00
Perrault Road	100 00
Bromley and Admaston Road	100 05
Brougham Township Roads:—	
Mount St. Patrick Road	199 75
Maloney Mountain Road	199 50
Mountain Road	100 00
Brudenell and Lyndock Township Roads:—	
Rockingham and Quadville Road	394 15
Killaloe and Rochfort Road	100 00
Brudenell, 16th Con.	200 00
Bigwood, Con. 5, Lots 2 to 4	394 17
Booth Road from Cache Bay	600 00
Burwash Road	275 00
Bexley Township Roads	200 00
Black River Road, Dalton	896 56
Bath, Main Road, Ernstown	450 00

Name of Road.	Expenditure.
Charlestown Lake Road	214 93
Calvin Township Roads:—	
Con. 5, 15th sideroad	300 00
Con. 8, 15th sideroad	200 00
Con. 4, Lots 23 and 24	400 00
Con. 1, 39th sideroad	200 00
Con. 2, Lot 16	200 00
Con. 4, 10th sideroad	200 00
Cameron Township Roads:—	
30th sideroad	200 00
Lot 1, Con. 24	200 00
Con. 24, Lot 7	200 00
Con. 25, Lot 6	197 70
Chisholm Township Roads:—	
Sideroad 20, Con. 13	200 00
Sideroad 5, Con. 5	296 96
Sideroad 5, Con. 4	200 00
Sideroad 20, Con. 5	300 00
Con. 12, Lot 4	200 00
Con. 8, 20th sideroad	299 41
Chisholm, Ferris and North Bay Road:—	
Sideroad 20, Con. 8	200 00
Sideroad 20, Con. 4	300 00
Sideroad 20, Con. 12	300 00
Cross Lake and Madawaska Road:—	
Con. 12, North	249 39
Lot 16, Con. 1, Lyell	249 14
Chandos Township Roads:—	
Scott Road	97 25
Coe Hill Road	75 00
Tanner Road	125 00
East Road	199 70
Roberts Road	98 75
Cavendish Township Roads:—	
Buckhorn and White Road	200 00
Cavendish and Gooderham Road	100 00
Cobden and Eganville Road	300 00
Caldwell and Badgerow Boundary	297 64
Cosby from North Boundary	299 50
Casimer and Jennings Road	500 00
Cosby between Cons. 1 and 2 across Lots 2 and 3	397 50
Cosby, Lots 6 and 7, Cons. 1, 2 and 3	250 00
Cosby, Lots 6 and 7, Cons. 1, 2 and 3, North from Con. 2	250 00
Cardiff Township Roads:—	
Con. 23, Lot 24	100 00
Con. 17 from Deer Lake	198 77
Carden, Con. 8 from Lot 9	200 00
Carden, Con. 1, Lots 17 and 18	100 00
Carden, Con. 5 from 4th Quarterline	99 12
Constance Creek, Tarbolton	300 00
Dungannon and Monteagle Boundary	250 00
Dungannon, Con. 2, Lot 21	200 00
Dalhousie, 2nd Con.	200 00
Dead Creek Road	100 00
Douro Township Roads	200 00
Dummer Township Roads	200 00
Duglas Station Road, Bromley	300 00
Douglas Road to Church	205 25

Name of Road.	Expenditure.
Dunnett, between Lots 2 and 3 across Cons. 2, 3 and 4	450 00
Dalton, Con. 1, Lots 15 to 17	200 00
Dalton Quarterline, Cons. 10 and 11	99 70
Deseronto to Bogart Road in Hungerford	595 95
Eganville and Killaloe Road	500 00
Eldon and Carden Boundary between Victoria Road and the Trent Canal	200 00
Fifth Depot Lake Road	200 00
Folger Road	500 00
Fort Stewart and Craigmont Road	199 11
Faraday and Herschel Townline	200 00
Frontenac and Leeds Townline Deviation	150 00
Ferris Township Roads:—	
Sideline 20, Con. 11	200 00
Sideroad 15, Con. 9	200 00
Lot 24, Con. 13	250 00
Boundary Lot 24	150 00
Lot 31, Con. 14	44 00
Con. 8, Lot 7	149 25
Lot 15, Con. 5	50 00
Sideroad 10, Con. 4	150 00
Con. 4, Lot 9	150 00
Con. 2, Lot 5	150 00
Lot 19, Con. 2	150 00
Lots 40 and 41, Con. 18	200 00
Lot 38, Con. 18	150 00
Fraser, 10th Con. opposite Lot 4	295 11
Field, Larocque Road between Cons. 5 and 6	300 00
Field, Grant Road, Cons. 1 and 2	300 00
Field between Lots 10 and 11 from Con. 6	300 00
Faulkner, Con. 5, from Lot 11	300 00
Foymont Hill Road	200 00
Galway Township Roads:—	
Jarson Road	100 00
Monck Road	100 00
Allan Line	100 00
Boundary Line	97 50
Golden Lake and Round Lake Road:—	
Berndt Section	200 00
Schimmins Section	100 00
Layman Section	200 00
Grattan Township Roads:—	
Coldwell Station Road	300 00
Con. 6	143 00
Donegal Road	100 00
Proving Line, Cons. 16 and 18	150 00
Con. 16	100 00
Con. 14	100 00
Douglas and Eganville	100 00
Griffith Township Roads:—	
Marchand Section	200 00
Legree Section	200 00
Griffith Road	100 00
Grant, Lots 11 and 12 from Grant Road	300 00
Glamorgan Township Roads	397 05
Hungerford and Sheffield Boundary North from Camden and Sheffield	$100 00
Howe Island Roads:—	
South Shore to North Shore	250 00
Lot 27, East of Lot 26	249 75
Hastings Road, Maynooth to Bancroft	200 00
Hastings Road, South of Bancroft	100 00

Name of Road.	Expenditure.
Hastings Road North of Maynooth	200 00
Hastings Road North of Ormsby	250 00
Hickey Settlement Road, Herschel	98 20
Hybla Station Road from Bartlett's Store	251 32
Haddo and Loudon Boundary	500 00
Hugel Township Roads:—	
Con. 2 from Lot 11 to 8	300 00
Hugel and Badgerow Boundary	350 00
Hugel, Cons. 2 and 3	350 00
Hungerford Township Roads	299 98
Hungerford and Tyendinaga Boundary	100 00
Huntingdon Swamp on 12th Con.	298 20
Hastings and Addington Boundary	100 00
Head, Clara and Maria Township Roads:—	
Stonecliff Road	149 95
Deux Rivieres Road	199 65
Bridge on Con. 8, Lot 17	150 00
Bridge, Lot 7, Range A.	130 00
Con. 8, Lot 8	150 00
Harvey Township Roads:—	
Sandy Lake Road	97 50
Deer Bay Road	100 00
Bobcaygeon Road	200 00
Freeborn Section	100 00
Hagarty, Richards and Burns Roads:—	
Hagarty, 6th Con.	399 25
Hagarty, 4th Con.	199 95
Wilno Road	100 00
Hagarty Road	100 00
Proving Line, Lots 10 and 11	299 88
Proving Line, Lots 15 and 16	198 50
Irving's Schoolhouse Road	276 25
Jones' Falls and Crosby Road	100 00
Kaladar, Anglesea and Effingham Road	493 70
Kingston and Perth Road	249 15
Kirkpatrick, between Cons. 2 and 3	300 00
Kirkpatrick, Piquette Road between Lots 7 and 8	300 00
Kirkfield and Dalrymple Road, Carden	99 87
L'Amable Station and Fort Stewart Road	250 00
Lower Faraday Road	150 00
Lanark, 10th Line	200 00
Lanark and Darling Road	200 00
Lavant, 8th Con. Road	499 99
Lavant to foot of Joe Lake	300 00
Lanark and Mississippi Road	90 00
Lyell Township Roads	500 00
Laxton, Digby and Longford Township Roads:—	
South Boundary of Laxton	200 00
Head Lake Bay Bridge in Laxton	199 85
Monck Road in Digby	100 00
North Quarterline, Laxton	99 60
Monck Road, West	100 00
Monck Road, Cons. 8 and 7	100 00
Lutterworth Township Roads:—	
Lutterworth and Anson Boundary to Deep Bay	100 00
Carnarvon Road from Lot 27	100 00
Miners' Bay Road, Lot 11, Con. 5	100 00
Boundary Sommerville and Lutterworth	49 99
Bobcaygeon Road	49 74

Name of Road.	Expenditure
Mississippi Road	300 00
Mississippi and Lanark Boundary	90 00
Moxam's Settlement Road	200 00
Musclow's Schoolhouse Road	200 00
McGregor Hill in Bangor	200 00
McLean Road in Wicklow	100 00
Maberley and Westport Road	300 00
Montague Road	292 85
Madawaska and Hastings Road:—	
Lot 28 in Lyell	200 00
Hastings Road, Lot 54	300 00
Mattawa and Pembroke Road:—	
Lot 12, Con. 10, Papineau	200 00
Con. 14, Lot 15 and 20, Papineau	196 34
Con. 12, Lot 20, West Papineau	100 00
Mattawan Township Roads:—	
Con. 2, Lot 34	150 00
Les Erables Road from Boundary	250 00
Les Erables Road, Murphy's Hill	149 85
Les Erables Road, Con. 4	150 00
Les Erables Road, Con. 6.	99 00
Mara, Cons. 4 and 5, Lots 2, 3 and 4	200 00
Mara, between Cons. A and 1, Lots 2 and 3	300 00
Mara and Carden Boundary	400 00
Methuen Township Roads:—	
Vansickle Section	50 00
Bourd Section	99 95
Dulmage Section	100 00
Matawatchan Township Roads:—	
Leclaire Section	100 00
McPherson Section	99 69
Lett Section	150 00
Adams Section	148 25
Mount St. Patrick and Douglas	103 25
Mount St. Patrick and Black Donald	100 25
Madawaska River Road, Griffith	100 50
Martland and Cosby Boundary:—	
Lot 12, East	200 00
Boundary Road	600 00
Martland and Scollard Boundary:—	
East End	200 00
Lot 9, East	300 00
From Lot 5	200 00
Mason and Scollard Boundary from the 4th Con.	299 73
McPherson, Cons. 1 and 2	500 00
Minden Township Roads:—	
Gelert from Minden	100 00
Carnarvon Road to Dysart	74 62
Bobcaygeon Road from Minden, North	50 00
Alsaw to Dysart	175 00
Monmouth Township Roads:—	
South Monmouth Road	196 96
Haliburton Road	200 00
Monck Road, Lot 4 to Uphill, Dalton	200 00
Monck Road, South to Johnston's Quarterline	200 00
Monck Road from 4th Quarterline, East to Johnston's Corners	99 96
Mud Lake Road	299 98
North Bay and Trout Lake—Lot 23, Con. 17	299 96
North Bay and Trout Lake—Lot 17, Con. 15	300 00
New Boyne Road	100 00

Name of Road.	Expenditure.
North Algona Township Roads:—	
Hoffman Section	200 00
Hildebrandt Section	200 00
Noack Section	200 00
Oso New Road	96 50
Plevna to Lavant Station	400 00
Perry Road from Dags Landing	199 60
Perth Road, Bedford from Lot 25, Con. 8	397 86
Portland and Loughboro' Boundary South of Harrowsmith	200 00
Perch Lake Road in Faraday	100 00
Peterson Road, Maynooth to Combermere	250 00
Pakenham and Kinburn Road	200 00
Pigeon Creek Road:—	
Haggert Section	150 00
Clark Section	50 00
Papineau, 10th Con. Road:—	
Con. 10, Lot 8	400 00
Sideroad 25, Con. 11	200 00
Con. 10, Lot 25	99 84
Papineau Township Roads:—	
Con. 15, Lot 30	150 00
Sideroad 15, Con. 11	300 00
Bridge, Con. 12, Lot 35	100 00
Con. 12, Lot 11	200 00
Sideroad 10, Con. 11	400 00
Con. 8, Lot 10	249 17
Con. 12, Lot 20	150 00
Con. 15, Lot 25	100 00
Boundary, Lot 35	150 00
Sideline 5, Con. 8	200 00
Pembroke Road, Lots 5 and 6, Con. 1	250 00
Pembroke & Eganville Road:—	
Lowe Section	500 00
Jackson Section	300 00
Perrault Settlement Road	100 00
Petawawa Township Roads:—	
Daber Section	299 49
Priebe Section	300 00
Perth Road Bridge	375 00
Rose Hill Road	399 22
Ryan Road from Peterson Road to New Carlow	150 00
Ramsay 7th Line Road	500 00
Richmond & Tyendinaga Boundary in Lennox	150 00
Rama Road:—	
Lot 24, Front Range	248 36
Kerr Section	249 70
Rama Boundary, Old and New Survey from Con. C:—	
McDonald Section	300 00
Wier Section	300 00
Rama & Morrison Townline	499 18
Rolph, Buchanan & Wylie Road:—	
Stewart Section	500 00
King Section, Wylie Road	500 00
Ross Township Roads	500 00
Radcliffe Township Roads:	
Rockingham & Combermere Road	100 00
Rockingham & Wilno Road	199 95
Combermere & Barry's Bay Road	200 00
Barry's Bay Road	100 00

Name of Road.	Expenditure.
Raglan Township Roads:—	
Raglan & Lyndock Road	100 00
Buderick Settlement Road	100 00
Beaudry Bridge and Road	99 96
Little Ireland Road	200 00
Con. 16	99 68
Schutt Road	98 00
Richmond & Tyendinaga Road, East Hastings	148 85
Snow Road	700 00
Storrington Boundary, 9th Con. Loughboro	250 00
Sherbrooke Road	100 00
Smith, Cons. 14 and 15 from Main Road	150 00
South Algona, Con. 8	150 00
South Algona, Sebastopol Townline	300 00
Stafford Road across Lot 32	700 00
Stafford Road, Con. 1, opposite Lot 20	500 00
Silver Lake Road:—	
Finucane Section	150 00
Marquette Section	150 00
Sebastopol Township Roads:—	
Foram Mountain Road	200 00
Muscl0w Section	200 00
Plaunt's Mountain Road	193 50
Scully and Graphite Mine Road	400 00
Sherwood Township Roads:—	
Kubieskie Section	199 95
Yantha Section	100 00
Murray Section	200 00
Blank, Wilno Road	100 00
Bloskie, Bell's Rapids Road	199 50
Chayvia Section, Bangor Road	90 00
Cybulski Section, Wilno Hill	100 00
Moran, Rockingham & Wilno	100 00
Smoky Falls Road	500 00
Sherbourne Township Roads:—	
Bobcaygeon Road	150 00
Howe Lake Road	149 24
Snowdon Township Roads:—	
Gelert Road	150 00
Bobcaygeon Road from Anson Boundary	50 00
Minden to Gelert	100 00
Snowdon, Bacon line from Monck Road	300 00
Stanhope Township Roads:—	
Carnarvon from Beach Lake Bridge	150 00
Bobcaygeon Road from Peterson's	50 00
Peterson Road to Kushog Bridge	199 70
Somerville Township Roads:—	
Monck Road East	100 00
Bobcaygeon Road, 6th Con.	98 04
Verulam and Somerville Boundary	100 00
Front Range, Lot 44	100 00
Burnt River Road	99 50
Second Quarterline, 9th Con., Victoria Road	100 00
Tamworth and California Road	300 00
Tamworth and Marlbank Road	300 00
Vanleek Settlement Road in Faraday	100 00
Victoria Road from Lot 15, North	200 00
Wollaston and Limerick Road	250 00
White Lake and Darling Road	200 00
White Lake Road, Pakenham	200 00

Name of Road.	Expenditure.
Widdifield Township Roads:—	
Larocque Hill Road	150 00
Lot 20, Con. C.	250 00
Sideroad 20, Con. 1	100 00
Sideline 16, Con. 2	149 61
Sideroad 14, Con. 1	150 00
Con. 2, Lot 9	150 00
Sideroad 14, Con. 5	100 00
Knight's Hall, Con. 1, Lot 8	100 00
Lot 8, Con. B	100 00
Sideroad, Con. B	99 40
North River Road from Lot 1	97 95
Lot 19, Con. C	50 00
Westmeath Proving Line from Con. 1	199 74
Wilberforce, 14th Con.	297 85
Wilberforce, Con. 12, McKibbon Section	198 89
Wilberforce, Con. 12, Sweeney Section	200 00
Wilberforce Townline:—	
Luloff Section	300 00
Krupp Section	200 00
Wilberforce Township Roads:—	
Miller Section	300 00
Leach Section	297 50
Huckabone Section	300 00

BY-LAWS.

Admaston By-law No. 204	350 00
Adolphustown By-law No. 67A	1,000 00
Bath By-law No. 2	249 09
Belmont and Methuen By-law No. 545	774 83
Bedford By-law No. 1B	999 24
Bexley By-law No. 438	500 00
Caldwell By-law No. 185	1,300 00
Carlow By-law No. 57	750 00
Cassimir, Jennings and Appleby By-law No. 63	804 00
Chisholm By-law No. 47	312 50
Douro By-law No. DCCLXXX	530 50
Dummer By-law No. 792	237 50
Dungannon By-law No. 84	300 00
Dysart By-law No. 552	2,500 00
Eldon By-law No. 410	1,000 00
Elzevir and Grimsthorpe By-law No. 325	600 00
Faraday By-law No. 51	340 00
Front of Yonge By-law No. 50	400 00
Harvey By-law No. 327	374 89
Hinchinbrooke By-law No. 7	1,038 69
Horton By-law No. 229	598 98
Huntingdon By-law No. 347	297 47
Kennebec By-law No. 12	750 00
Lakefield By-law No. 515	400 00
Limerick By-law No. 8	750 00
Loughboro By-law No. 60A	800 00
Madoc By-law No. 335	600 00
Mara By-law No. 482	1,500 00
Marmora and Lake By-law No. 478	599 65
Martland By-law No. 79	498 40
Mayo By-law No. 266	400 00
Monteagle and Herschel By-law No. 425	991 39
Murray By-law No. 802	1,250 00
Newburg By-law No. 186	500 00
North Monaghan By-law No. 682	600 00
Olden By-law No. 32B	739 31
Oso By-law No. 74	500 00

Name of Road.	Expenditure.
Pittsburg By-law No. 12	1,200 00
Portland By-law No. 548	989 26
Ratter and Dunnett By-law No. 86	1,000 00
Rawdon By-law No. 339	400 00
Richmond By-law No. 593	300 00
Ross By-law No. 311	1,400 00
Rear of Leeds and Lansdowne By-law No. A	125 00
Seymour By-law No. 868	700 00
Smith By-law No. 721	247 23
Stafford By-law No. 639	623 83
Storrington By-law No. 451	375 00
Springer By-law No. 273	1,000 00
South Crosby By-law No. 799	600 00
Tudor and Cashel By-law No. 8	995 05
Tyendinaga By-law No. 627	500 00
Westmeath By-law No. 107	1,099 88
Wolfe Island By-law No. 417	1,000 00
Wollaston By-law No. 11	500 00
Inspection (East Division)	5,366 65
Boulter, Lot 8, Con. 2, Balance 1913	150 00
Laroeque Road, Balance 1913	24 90
Monck Road, Rama, Balance 1913	19 25
Tyendinaga and Richmond Boundary, Balance 1913	28 61
Old Perley Road, Balance 1912	49 91
Madawaska and Hastings Road, Balance 1912	6 25
Murchison, Con. 1, Lot 23, Balance 1912	19 88
Adolphustown By-law, No. 66A, Balance 1913	300 00
Holden By-law No. 26B, Balance 1913	728 31
Storrington By-law No. 447, Balance 1913	397 88
Portland By-law No. 535, Balance 1913	800 00
Papineau Township Roads, Balance 1913	24 75
Griffith and Matawatchan, Balance 1913	50 00
	$138,876 09

TEMISKAMING.

Armstrong, Cons. 5 and 6, Lots 8 to 12	$1,000 00
Armstrong, Cons. 1 and 2, Lots 11 and 12	399 84
Armstrong, Cons. 2 and 3, Lots 8 to 12	400 00
Armstrong, Lots 4 and 5, Cons. 1 to 4	500 00
Armstrong, South Boundary, Lots 7 to 10	400 00
Beauchamp, Lots 6 and 7, Con. 1 and East	398 97
Beauchamp, Lots 2 and 3, Con. 3	299 65
Brethour, Cons. 1 and 2, Lots 9, 10 and 11	393 97
Brethour, South Boundary, Lots 1 to 6	699 10
Brethour, South Boundary, Lots 7 to 11	1,000 00
Brethour, Cons. 4 and 5, Lots 4 to 9	900 00
Brethour, Cons. 5 and 6, Lots 5, 6, 7 and 8	698 17
Bryce, South Boundary, Lots 9 to 12	800 00
Bucke Centre of Lot 4, Con. 5	297 50
Bucke, North Boundary from Lot 1, Eastward	434 29
Bucke, Cons. 4 and 5, West from Lake	800 00
Bucke, West Boundary	1,000 00
Bucke, Lots 8 and 9, Cons. 5 and 4	1,198 94
Cane, Lots 10 and 11, Con. 4	500 00
Cane, Lots 8 and 9, Cons. 2 to 5	791 83
Casey, Cons. 2 and 3, Lots 10 and 11	600 00
Casey, Cons. 2 and 3, Lot 6 and South	599 15
Casey, Lots 2 and 3, Cons. 1, 2 and 3	399 05
Casey, Cons. 3 and 4, Lots 9, 10 and 11	600 00
Casey, Cons. 2 and 3, Lots 2 and 1	700 00
Casey, Lots 8 and 9, Cons. 4, 5 and 6	499 00
Casey, Cons. 6 across Lots 1, 2 and 3	501 65
Casey, West Boundary, Cons. 1, 2 and 3	1,196 77

Name of Road.	Expenditure.
Dack, Cons. 3 and 4 from Sunday Creek	600 00
Dack, Lots 6 and 7, Cons. 1 and 2, Westerly	1,178 07
Elk Lake Shore Road from Cane to Elk City	1,200 00
Elk Lake Shore Road Extension to North Boundary of James	275 00
Evanturel, Koch Road	175 00
Evanturel, South Boundary, Lots 11 and 12 and West	800 00
Evanturel, Lots 8 and 9, Cons 1, 2 and 3	494 35
Evanturel, Cons. 5 and 6, Lots 1 to 9	1,199 23
Firstbrook, Cons. 4 and 5, Lots 1 to 12	500 00
Harley, Cons. 3 and 4 across Lots 2 to 6	1,500 00
Harley, Lots 10 and 11, Cons. 1 and 2	800 00
Harley, Cons. 2 and 3, Lots 4, 5 and 6	500 00
Harley, Lots 2 and 3, Con. 2	599 71
Harley, Cons. 5 and 6, Lots 3 and 4	599 90
Harley, Lots 6 and 7 across Con. 2	600 00
Harley & Kern's Boundary, Cons. 4, 5 and 6	900 00
Harris Main Road:—	
West End	998 91
Centre Division	976 52
North End	1,000 00
Harris, across Con. 6, Lots 2 and 3	400 00
Harris, Cons. 4 and 5, Lot 2, West	500 00
Harris, Lots 4 and 5, Cons. 4 and 5	799 71
Harris and Casey Boundary, Lots 3 and 4	200 00
Haris and Dymond Boundary from the 3rd Con.	600 00
Hudson, North Boundary, Lots 1 and 2	698 55
Hudson, Lots 8 and 9, Con. 6	500 00
Hudson, Cons. 5 and 6, Lots 3 and 4	797 00
Hudson, Lots 2 and 3, Con. 1 and part of 2	666 91
Henwood, Lots 6 and 7, Cons. 3 and 4	300 00
Henwood, Lots 2 and 3, Con. 5	500 00
Henwood, Lots 6 and 7, Con. 5 and part of 6	497 70
Henwood, Cons. 3 and 4, Lots 1 to 10	600 00
Henwood, Cons. 2 and 3, Lot 4	300 00
Henwood, Lots 8 and 9, Cons. 5 and 6	499 65
Henwood, Lots 8 and 9, Cons. 4 and 3	800 00
Henwood, Cons. 5 and 6, Lots 1 and 2	499 99
Henwood, West Boundary, Con. 4	500 00
Henwood, Lots 10 and 11, Cons. 4 and 3 and West	1,480 46
Hilliard, Cons, 4 and 5, Lots 9 to 12	800 00
Hilliard, Cons. 4 and 5, Lots 1 to 6	1,000 00
Hilliard, Lots 8 and 9, Cons. 1 and 2	999 50
Hilliard, Cons. 1 and 2, Lots 9 and 10	447 37
Hilliard, Cons. 1 and 2, Lots 6, 7 and 8	711 95
Hilliard, Cons. 3 and 4, Lots 5, 6, 7 and 8	770 20
Hilliard, Cons. 5 and 6, Lots 9 and 10 and South	600 00
Ingram, Lots 4 and 5, Cons. 5 and 6	600 00
Ingram, Lots 6 and 7, Cons. 1, 2 and 3	296 70
Ingram, Cons. 3 and 4, Lot 8	700 00
Ingram, Cons. 4 and 5, Lots 5 to 12	800 00
Lundy, Lots 4 and 5, Con. 3	392 85
Pense, Lots 2 and 3, Cons. 1, 2 and 3	700 00
Pense, Cons. 3 and 4, Lots 3 to 9	896 35
Pense, South Boundary, Lots 1 to 6	598 75
Robillard, Lots 10 and 11, Cons. 1, 2 and 3	900 00
Robillard, Lots 6 and 7, Cons. 3 and 4	700 00
Robillard, Cons. 3 and 4, Lots 1, 2 and 3	400 00
Silver Centre Mining Roads	1,183 37
Silver Lake to Mape Johnston's Mine	275 00
Tudhope, Cons. 1 and 2, Lots 11 to 7 and North	988 29
Tamarack Creek, Destroy Beaver Dam	13 00

BY-LAWS.

Name of Road.	Expenditure.
Bucke By-law No. 175	$1,425 10
Casey By-law No. 19	1,209 89
Dymond By-law, No. 105	2,359 40
Evanturel By-law No. 106	875 00
Harley By-law No. 163	1,456 81
Harris By-law No. 32	1,260 29
Hilliard By-law No. 46	686 04
Hudson By-law No. 41	762 50
Kerns Bylaw No. 108	1,500 00

TRUNK ROADS.

Sesekiniki and Wolf Lake Trunk Road	$988 03
Elk Lake-Gowganda Trunk Road	986 95
Haileybury-Montreal River Trunk Road	2,001 15

Inspection (Temiskaming)	$1,191 40
F. Aubert Estate	62 60
Evanturel Township, Balance 1913	75 33
Casey, Con. 5, balance 1913 (Sheedy)	17 50
Robillard Township, Balance, 1913 (Fowke)	30 32
David Chalmers, Balance on Hill's Landing and other roads, 1913	170 39
George Reichan, Kelso's Hill Landing, Balance 1911	612 78
Brethour, Balance 1913	99 09
Cane Township, Balance 1913	25 00
South Lorraine Road, Balance 1913	94 23
Bucke By-law, balance 1913	733 58
	$77,443 25

RECAPITULATION.

North Division	$210,340 81
West Division	56,411 31
East Division	138,876 09
Temiskaming	77,443 25
Total	$483,071 46

Department of Public Works, Toronto,
October 31st, 1914.

M. P. DOHERTY.
Accountant, Colonization Roads

STATEMENTS

OF THE

ACCOUNTANT

AND

LAW CLERK

Department of Public Works, Ontario.
Toronto, February, 1915.

Hon. F. G. Macdiarmid,

Minister of Public Works, Ontario.

Sir,—I have the honour to submit the following statements of capital expenditure on public buildings, public works, colonization roads, good roads (highway improvement), aid to railways, etc., and of contracts entered into in connection therewith, being: (1) The capital expenditure for public buildings, public works, drainage, colonization roads, good roads and aid to railways, etc., for twelve months to the 31st of October, 1914; (2) the total capital expenditure on public buildings, public works, colonization and mining roads, good roads (highway improvement), aid to railways, etc., from the 1st of July, 1867, to the 31st of October, 1914; (3) a classified statement showing (*a*) the expenditure for thirty-seven years and six months from the 1st of July, 1867, to the 31st of December, 1904; (*b*) the expenditure for eight years and ten months from the 1st of January, 1905, to the 31st of October, 1913; (*c*) the expenditure for one year to the 31st of October, 1914; and (*d*) the grand total of expenditure from the 1st of July, 1867, to the 31st of October, 1914; and (4) a statement showing the several contracts and bonds entered into with His Majesty during the twelve months ending the 31st of October, 1914, in connection with the sundry buildings and works under the control of your Department.

I have the honour to be, Sir,

Your obedient servant,

J. P. Edwards,

Accountant, etc., Public Works.

STATEMENT No. 1.

Being a statement of expenditure on capital account for public buildings, public works, drainage, colonization and mining roads, good roads (Highway Improvement Act), aid to railways, etc., for the year ending October 31st, 1914. (See also Statement No. 2.)

Name of Work.	—	Amount.
	$ c.	$ c.
PUBLIC BUILDINGS:		
New Government House , construction &c.	.....	108,598 08
Parliament Buildings, New North Wing, construction	16,536 30	
" " New North Wing, furnishings and equipment	4,882 20	
		21,418 50
" " Reconstruction of West Wing	4,857 94	
" " Reconstruction of West Wing, balance workmen's insurance	103 00	
		4,960 94
" " Automatic Fire Alarms, East Wing.. and Centre Building	218 00	
" " Hydro-Electric Equipment and fittings	249 80	
" " Treasury Department and Post Office	2,902 80	
" " Alterations in No. 4 Queen's Park (used for Library) restoring same to normal condition	800 00	
		4,170 60
" " No. 5 Queen's Park' alterations etc..	.....	31 80
Osgoode Hall, Repairs, painting, cleaning, alterations, etc...	13,665 53	
" " Furnishings, vault fittings, etc.	2,224 36	
" " Electric wiring and fixtures	760 45	
" " Dumb waiter	590 00	
" " Telephone and Telegraph service	2.772 92	
		20,013 26
Hospital for Insane, Brockville	.....	88,013 68
" " Cobourg	.....	1,200 23
" " Hamilton	.....	24,631 69
" " Kingston	.....	21,036 70
" " London	.....	44,955 10
" " Mimico	.....	11,851 46
" Idiots, Orillia	.....	71,161 12
" Insane, Penetanguishene	.....	9,582 39
" " Toronto	3,864 05	
" " Whitby	445,914 87	
		449,778 92
" Epileptics, Woodstock	.....	7,124 23
Central Prison, Toronto	1,910 18	
New Provincial Prison, Guelph	398.391 92	
		400,302 10
Andrew Mercer Reformatory, Toronto	.....	418 16
Normal and Model Schools, Toronto	.....	6,772 76
" " " Ottawa	.....	1,797 60
Normal School, Hamilton	.....	989 44
" " London	.....	354 76
" " Peterborough	.....	396 26
" " Stratford	.....	1,329 05
" " North Bay	.....	3,674 18
English-French Training School, Sandwich	.....	291 30
Ontario School for the Deaf, Belleville	.....	130,319 24
Ontario School for the Blind, Brantford	.....	62,295 77
Ontario Agricultural College, Guelph	.....	72,293 35
Horticultural Experimental Station, Jordan Harbour	.....	1,301 03
Ontario Veterinary College, Toronto	.....	164,023 07
Colonization and Immigration Office, Toronto	.....	135 20

STATEMENT No. 1.—Continued.

Name of Work.	—	Amount.
	$ c.	$ c.
Algoma District:		
Court House, Gaol, Registry Office, etc., Sault Ste. Marie ...	337 92	
Industrial Farm, Sault Ste. Marie	42 50	
		380 42
Kenora District:		
Court House and Gaol, Gaoler's Residence, Registry Office, Kenora	1,708 48	
New Registry Office, Kenora	532 82	
		2,241 30
Muskoka District:		
Court House, Gaol and Registry Office, Bracebridge	.....	272 65
Manitoulin District:		
Court House, Gaol etc., Gore Bay	.....	1,082 84
Nipissing District:		
Court House, Gaol, Registry Office, and Gaoler's House, North Bay	.....	2,450 43
Parry Sound District:		
Court House, Gaol, Registry Office, etc., Parry Sound	402 25	
" " " " " (Unpaid accounts, 1913)	17 00	
		419 25
Rainy River District:		
Registry Office, Fort Frances	359 24	
Court House, Fort Frances	55,735 71	
		56,094 95
Sudbury District:		
Court House, Gaol, and Registry Office, Sudbury	1,158 14	
" " " " " (Unpaid accounts, 1913)	11 55	
Lockup, Massey (grant)	1,000 00	
Industrial Farm, Burwash	14,626 70	
" " " Compensation to settlers for land expropriated (Special Warrant)	3,035 00	
		19,831 39
Thunder Bay District:		
Court House, Gaol, Registry Office, Port Arthur	698 09	
Industrial Farm, Fort William	32,310 87	
" " (Unpaid accounts 1913)	6 75	
" " additional buildings	5,680 30	
" " Purchase of Live Stock (Special Warrant)	2,480 31	
		41,176 32
Temiskaming District:		
New Court House, Haileybury	48,461 66	
New Registry Office, Haileybupry	8,453 00	
Temporary Court House (rent)	2,500 00	
Lockup at Cobalt	170 50	
" South Porcupine	52 76	
		59,637 92
Haliburton, Provisional County of:		
Lockup at Gooderham	.....	200 00
Fish and Game, Boat House, Kenora	945 00	
" " Belleville	179 06	
Fish Hatchery Building, Mount Pleasant	2,424 42	
		3,548 48
Public Buildings	.....	1,922,557 92

STATEMENT No. 1.—Continued.

Name of Work.	—	Amount.
	$ c.	$ c.
PUBLIC WORKS:		
Admaston Bridge, Bonnechere River		1,246 61
Admaston Bridge Ninth Concession		399 83
Algoma, Bonnechere Bridge (conditional)		2,500 00
Ansonia Bridge, Lefroy		3,277 42
Bangor, Wicklow and McClure Bridges		399 25
Bar River Bridge, Laird and McDonald		394 21
Black Donald Creek Bridge, Brougham		250 00
Black Sturgeon Bridge, Mellick		939 05
Beauchamp Town line Bridge		598 17
Bell's Settlement Bridge, Croft Township		286 33
Big Carp Bridge, Awengo (grant)		700 00
Boda Creek Bridge, Shakespeare		389 79
Breakwater at Union, South Essex		2,453 43
Bruce Mines Bridge		305 20
Cardiff, Monmouth Townline Bridge		597 53
Carlow, Papineau Bridge, Concession 13		794 88
Casey-Brethour Bridge, Blanche River		6,033 16
Chippewa Creek Bridge, Widdifield		1,842 38
Christian's Creek Bridge, grant to Fenelon		200 00
Clark's Bridge, grant to Kennebec		600 00
Clare River Bridge, Sheffield Township		1,497 68
Clyde River Bridge, grant to South Canonto		499 00
Corbett Creek Bridge, Oliver Tp.		56 78
" " " " (1912-13 accounts)		20 00
Creighton-Vermilion Townline Bridge		398 74
Dack, Sunday Creek Bridge		259 78
Dean Lake and Thompson Rd. Bridge, Algoma District		421 85
Doe Bank Bridge, Watt Township, Muskoka District		1,998 28
Denbigh Bridge, Hyde Creek		600 24
" " " " (1913 accounts)		324 69
Dunsford Bridges, Verulam grant		200 00
Equipment, instruments, machinery, etc.		2,986 30
Expenses, supervising foreman		991 02
Fifth Concession Bridge, Wabi, Dymond		1,499 17
Finlay's Bridge, Echo River, Kehoe Township		499 41
Garden River Bridge		4,668 79
" " " (1912-13 accounts)		90 00
Gillies Township Bridges		472 03
Gough's Bridge, Himsworth Township		800 00
Grass River Bridge, Stanhope		281 55
Great Northern Road Bridge, Plummer		362 75
Griffith's Bridge, repairs, accounts 1912-13		247 50
Hog Creek and North River Bridges:		
Hog Creek Bridge	1,841 23	
North River Bridge, North Orillia	1,646 43	
		3,487 66
Houles and Black Creek Bridges, Salter		3,496 71
Jean Baptiste Bridge Third Concession, Armstrong		464 23
Judge Bridge, White River		2,035 45
" " " " (1912-13 accounts)		171 14
Kahshee and Maxwell Bridges:		
Kahshee Bridge	96 00	
Maxwell Bridge	173 00	
		269 00
LaBlanche Bridge, Townline, Marter Tp. (Special Warrant)		4,979 55
Lee Valley Bridge, La Cloche Creek, Algoma District		2,890 78
Leeburn Bridge, Aberdeen		2,604 06
Little Rapids Bridge, Thessalon, Algoma District		653 64
" " " (1912-13 accounts)		110 47
Little Serpent Bridge, Victoria		390 13
Lockington Bridge, Lash		2,182 57
McKellar Village Bridge, Parry Sound District		942 28

STATEMENT No. 1.—*Continued.*

Name of Work.	—	Amount.
		$ c.
Maintenance locks, dams, bridges, etc.	.....	31,220 04
Manitoulin Bridges	.....	894 41
Mississauga Bridge, Thompson Township (A. Baker, compensation for cow)	.....	75 00
Mountain Lake Bridge, Minden	.....	794 59
Mud Creek Bridge, Portland	.....	1,000 00
Muskoka Road Bridge, Koshie Creek	.....	2,746 40
O'Connor Township bridges	.....	849 72
Omo Cree Bridge, Pembroke and Mattawa Road	.....	2,927 80
Orillia Township Bridge, to complete grade	.....	500 00
Otter Bridge, Casey-Brethour Townline	.....	803 35
" " " " " (1912-13 accounts)	.....	140 38
Papineau Bridge, Boon Creek	.....	11 60
Pearson Township Bridges	.....	792 33
Peninsula Canal Bridge, Fairy Lake	.....	4,148 55
Pickerel River improvement, Parry Sound District	.....	2,545 32
" " " (1912-13 accounts)	.....	177 44
Port Sydney, dam, Muskoka River	.....	4,668 94
Poverty Lake Bridge, Monmouth	.....	406 11
Radcliffe Bridge	.....	399 53
Rates Bridge, Thessalon River	.....	959 08
River Valley Bridge, Sturgeon River	.....	843 76
Rose and Plummer Township bridges	.....	497 50
Root Bridge, Sixth Concession, Tarentorus	.....	1,056 23
Rubber boots, purchase of	.....	128 43
Sampson's and Sparks' Creek Bridges, Bonfield	.....	2,484 82
Sand Lake Bridge, Parry Sound District	.....	986 66
Seguin River Bridge, Christie	.....	1,955 89
Shallow Lake and Wabigoon Bridges	.....	3,120 12
Six Mile Bridge, Shuniah	.....	1,433 25
South Channel Bridge and Bala Dam	.....	2,424 75
Stanley Bridge, repairs	.....	6 80
Sturgeon Falls Bridge	.....	7,095 43
Sturgeon Bridge, Mather and Doble Townline	.....	358 33
Sunday Creek Bridge, Robillard	.....	323 66
Suddaby's Bridge, Algoma District	.....	81 71
Surveys and Inspections	.....	2,280 45
" " (1912-13 accounts)	.....	286 00
Swamp Bridge Creek, grant to Clarendon	.....	188 70
Sylvester Bridge, Kirkpatrick	.....	724 71
Tomstown Bridge, repairs	.....	400 00
Two Tree Bridge, St. Joseph Island	.....	10 00
Wabigoon Bridge, Eaton Township	.....	1,185 90
Wages of supervising foremen	.....	2,851 50
Warren River Bridge, Veuve River	.....	161 22
" " " " " (1912-13 accounts)	.....	161 22
Waters Township, Second Concession Bridge	.....	1,736 80
White Bridge, Mayo	.....	291 73
Widdifield Bridges	.....	1,604 74
Wolseley Bridge, Guy's Hill, Martland	.....	993 12
Public Works	.....	159,794 49
DRAINAGE WORKS:		
Algoma District Road, drainage	.....	622 00
Collins' Creek improvement	.....	396 51
Crow Lake Channel improvement	.....	299 96
East Simcoe District Road, drainage	.....	500 00
Fish Creek, improvement, Hinchinbrook	.....	388 71
Howick Township, drainage	.....	200 00
McLellan and Booth creek drain, Dawn	.....	1,000 00
Mad River improvement (conditional)	.....	1,823 30
Manitoulin District Road, drainage	.....	722 12
Mara Township Road, drainage	.....	39 37
Mara and Rama, drainage	.....	1,328 44

STATEMENT No. 1.—*Concluded.*

Name of Work.	—	Amount.
	$ c.	$ c.
Muskoka District Road, drainage		483 63
Nipissing, drainage accounts 1912-13		33 18
Nipissing District Road, drainage		1,497 34
Ninth Concession Drain, Brooke		1,000 00
Nottawasaga River improvement		873 01
Nottawasaga River, drainage		40 00
Parry Sound District, drainage		348 85
Pickerel River improvement, Huntingdon (conditional)		500 00
Draining Rainy River roads		5,946 24
Rainy River drainage, accounts 1911		128 52
Sturgeon Falls District, road drainage		999 84
Sudbury District, road drainage		1,499 00
Temiskaming District, road drainage		1,892 14
Temiskaming, drainage accounts, 1912-13		225 50
Drainage Works		22,787 66
DRAINAGE AID GRANTS:		
Little Creek Drain, Tilbury North		2,000 00
Cobb Lake drainage, Clarence		3,000 00
McFarlane Relief Drain, Dover		4,000 00
North East Drain, Ellice and Logan		1,000 00
Long Marsh, extension drain, Anderdon		1,500 00
Pelee Point Marsh drainage, Mersie, by-law 815		1,500 00
Stewart Proulx Drain, Lochiel		800 00
Stoney Creek Drain, Cornwall		1,500 00
Touluse Drain, Dover		500 00
Wet Luther drainage		500 00
Michener and Wignell drain, Humberstone		800 00
Drainage Aid Grants		17,100 00
Colonization Roads	480,845 27	
Colonization Roads (Special Warrant)	2,226 19	
Colonization Roads		483,071 46
Good Roads (Highway Improvement)	294,187 38	
Object Lesson Roads, Highway improvement	6,011 59	
Good Roads		300,198 97
Aid to Railways (Subsidy fund)		139,112 54
Grand Total		3,044,623 04
RECAPITULATION:		
Public Buildings		1,922,557 92
Public Works	159,794 49	
Public Works, drainage	39,887 66	
		199,682 15
Colonization Roads		483,071 46
Good Roads (Highway improvement)		300,198 97
Aid to Railways (Subsidy fund)		139,112 54
Grand Hotal		3,044,623 04

Department of Public Works, Ontario.
Toronto, February, 1915.

J. P. EDWARDS,
Accountant, etc., Public Works.

STATEMENT No. 2.

Being a statement of expenditure on Capital Account for Public Buildings, Public Works, Colonization and Mining Roads, Aid to Railways, Good Roads (Public Highway Improvement), etc., as follows: (1) The total expenditure from the 1st of July, 1867, to the 31st October, 1913; (2) the expenditure for the twelve months ending the 31st of October, 1914; and (3) the grand total of expenditure from the 1st of July, 1867, to the 31st of October, 1914.

Name of Work.	Expenditure 1st July, 1867, to 31st Oct., 1913.	Expenditure Fiscal Year ending 31st Oct. 1914.	Total Expenditure to 31st Oct., 1914.
PUBLIC BUILDINGS:	$ c.	$ c	$ c.
Old Government House	183,860 86	.....	183,860 86
New Government House	675,836 67	108,598 08	784,434 75
Old Parliament and Departmental Buildings	85,285 98	.....	85,285 98
New Parliament and Departmental Buildings (Original cost of construction)	1,282,679 04	.....	1,282,679 04
Parliament and Departmental Buildings equipment, furnishings, library fittings, grounds, roads, plant house and alterations, etc., No. 4 Queen's Park (Library) included	249,462 90	3,702 80	253,165 70
Automatic Fire Alarm, East and Centre Buildings	5,234 39	218 00	5,452 39
No. 5 Queen's Park, purchase of house, ground rent, insurance, etc.	12,515 44	.....	12,515 44
No. 5 Queen's Park, alterations and equipment	14,063 85	31 80	14,095 65
Hydro underground service	985 18	.....	985 18
Hydro equipment	11,784 48	249 80	12,034 28
Legislative Chamber, correcting accoustics	8,185 00	.....	8,185 00
Parliament Buildings, addition of New North Wing, furnishings, equipment, library, etc.	730,135 61	21,418 50	751,554 11
Parliament Buildings, reconstruction and fireproofing of West Wing	654,048 02	4,960 94	659,008 96
Osgoode Hall, Toronto	286,492 10	20,013 26	306,505 36
" " " addition to Centre Building (north wing and equipment).	143.981 30	.....	143,981 30
Hospital for Insane, Brockville	698,505 88	88,013 68	786,519 56
" " Cobourg	143,771 01	1,200 23	144,971 24
" " Hamilton	1,136,464 55	24.631 69	1,161,096 24
" " Kingston	669.216 98	21,036 70	690,253 68
" " London	1,258,149 51	44,955 10	1,303,104 61
" " Mimico	783,532 75	11,851 46	795,384 21
" " Penetanguishene	169,791 62	9,582 39	179,374 01
" " Toronto	448,849 87	3,864 05	452,713 92
" " Whitby, add'nl bldgs., land, equipment, etc.	346,057 50	445,914 87	791,972 37
Hospital for Feeble Minded, Orillia	679,355 11	71,161 12	750,516 23
Hospital for Epileptics, Woodstock	259,367 56	7,124 23	266,491 79
Central Prison, Toronto	959,667 30	1,910 18	961,577 48
New Provincial Prison, Guelph	948,391 62	398,391 92	1,346,783 54
Mercer Reformatory for Females, Toronto.	290,952 80	418 16	291 370 96
Normal and Model Schools, Toronto	285,497 22	6,772 76	292,269 98
Normal and Model Schools, Ottawa	270,141 92	1,797 60	271,939 52
Normal School, London	122.081 91	354 76	122,436 67
Normal Schools, four additional ($4,618.33), included now with schools as follows:			
Normal School, Hamilton	91,921 71	989 44	92,911 15
" " North Bay	101,070 48	3,674 18	104.744 66
" " Peterborough	97,825 50	396 26	98.221 76
" " Stratford	89,716 98	1,329 05	91,046 03

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure 1st July, 1867. to 31st Oct., 1913.	Expenditure Fiscal Year ending 31st. Oct. 1914.	Total Expenditure to 31st Oct., 1914.
PUBLIC BUILDINGS—*Continued.*	$ c.	$ c.	$ c.
English-French Training School, Sandwich.	12,049 10	291 30	12,340 40
Reformatory for Boys, Penetanguishene....	191,512 00	.....	191,512 00
Ontario School for the Deaf, Belleville.....	468,754 32	130,319 24	599,073 56
Ontario School for the Blind, Brantford....	407,925 32	62,295 77	470,221 09
Ontario Agricultural College, Guelph	909,300 14	72,293 35	981.593 49
Provincial Building, Canadian National Exhibition Association, Toronto (grant)..	35,000 00	.....	35,000 00
Horticultural Experimental Station, Jordan Harbor	42,272 29	1,301 03	43,573 32
Dairy School, Kingston	23,613 56	.....	23,613 56
Dairy School, Strathroy	14.583 71	.....	14,583 71
Veterinary College, Toronto	252 23	.....	252 23
New Veterinary College, University Avenue, Toronto	143,473 39	164,023 07	307,496 46
School of Mining, Kingston	4,070 00	.....	4,070 00
Normal College, Hamilton (equipment Domestic Science Room)	854 25	.....	854 25
School of Practical Science (College of Technology)	59,100 26	.....	59,100 26
School of Practical Science (Queen's Park).	252,535 56	.....	253,535 56
School of Practical Science, New Chemistry and Milling and Mining Building.....	448,213 15	.....	448,213 15
Children's Shelter, Toronto	8.864 95	.....	8,864 95
Immigration Office, Toronto	8,883 33	135 20	9,018 53
Fish and Game, Boat House and Hatchery Building	2,833 52	3,548 48	6.382 00
Ontario Government Office Building, London, England	45,336 21	.....	45,336 21
Winter Fair Building, Guelph	25,101 25	.....	25,101 25
Hygienic Institution, London	74,297 41	.....	74,297 41
Agricultural Hall, Toronto	324 00	.....	324 00
Government Farm, Mimico	51,646 34	.....	51,646 34
Pioneer Dairy Farm, Algoma	5,178 43	.....	5,178 43
Brock's Monument, Queenston Heights	4,605 31	.....	4,605 31
Niagara River Fence	8,025 43	.....	8,025 43
ALGOMA DISTRICT:			
Court House, Gaol and Registry Office, Sault Ste. Marie	34,650 86	337 92	34,988 78
Registry Office, addition to, Sault Ste. Marie	11,658 02	.....	11,658 02
Lock-up, Bruce Mines	3,117 48	.....	3,117 48
" Blind River	2,642 87	.....	2 642 87
" Chapleau	1,126 49	.....	1,126 49
" Cutler	864 70	.....	864 70
" Echo Bay	500 00	.....	500 00
" Hilton	500 00	.....	500 00
" Thessalon	2,221 99	.....	2,221 99
" Wawa	1,330 16	.....	1,330 16
Industrial Farm, Sault Ste. Marie	63 10	42 50	105 60
KENORA DISTRIT:			
Court House and Gaol, Gaoler's Residence, Registry Office, etc., Kenora	43,444 90	1,708 48	45,153 38
New Registry Office, Kenora	15,400 96	532 82	15,933 78
New Court House, Kenora	59,238 52	.....	59,238 52
Land Titles Office, Kenora	575 00	.....	575 00

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure 1st July, 1867, to 31st Oct., 1913.	Expenditure Fiscal Year ending 31st Oct., 1914.	Total Expenditure, to 31st October 1914.
PUBLIC BUILDINGS—*Continued.*			
KENORA DISTRICT.—*Continued.*	$ c.	$ c.	$ c.
Sea Wall, Kenora	3,197 65	.....	3,197 65
Grounds and Walks, Kenora	1,148 76	.....	1,148 76
Lock-up at Dryden	521 00	.....	521 00
MUSKOKA DISTRICT:			
Court House, Gaol, and Registry Office at Bracebridge	36,221 52	272 65	36,494 17
Lock-up and Court Room at Huntsville	8,364 85	.....	8,364 85
Lockup and Court Room at Bayside	300 00	.....	300 00
Immigration Sheds at Gravenhurst	355 00	.....	355 00
MANITOULIN DISTRICT:			
Grand Manitoulin Island, three Lock-ups Gore Bay, Little Current and Manitowaning), transferred from Algoma Dist.	22,287 60	.....	22,287 60
Lock-up, Killarney	1,298 97	.....	1,298 97
Court House, Gaol, etc., Gore Bay	8,380 76	1,082 84	9,463 60
Lock-up, Manitowaning	379 74	.....	379 74
" Providence Bay (grant)	500 00	.....	500 00
" Little Current	58 95	.....	58 95
NIPISSING DISTRICT:			
Lock-up, Court Room and Registry Office and Gaoler's House, North Bay	51,352 48	2,450 43	53,802 91
Lock-up at Bonfield	694 67	.....	694 67
" Cache Bay	500 00	.....	500 00
" Markstay	600 00	.....	600 00
" Mattawa	14,949 19	.....	14,949 19
" Sturgeon Falls	2,266 28	.....	2,266 28
" Warren	600 00	.....	600 00
PARRY SOUND DISTRICT:			
Registry Office, Lock-up and Court Room, House for Gaoler, Land Titles Office, etc., Parry Sound	48,537 00	419 25	48,956 25
Lock-up at Magnetawan	645 56	.....	645 56
Lock-up and Court Room, Burk's Falls	6,621 96	.....	6,621 96
Lock-up at French River	1,198 62	.....	1,198 62
" Dunchurch	609 00	.....	609 00
" Emsdale	300 00	.....	300 00
" Byng Inlet	1,232 35	.....	1,232 35
" South River	500 00	.....	500 00
" Powassan	1,250 00	.....	1,250 00
" Callender	500 00	.....	500 00
" Sundridge	500 00	.....	500 00
RAINY RIVER DISTRICT:			
Registry Office, Fort Frances	2,274 33	359 24	2,633 57
Gaol, etc., Fort Frances	17,813 58	.....	17,813 58
New Court House, Fort Frances	12,777 95	55,735 71	68,513 66
Lock-up at Mines Centre	1,205 48	.....	1,205 48
" Emo	1,888 94	.....	1,888 94
" Atikokan	1,571 31	.....	1,571 31
" Beaver Mills	1,840 71	.....	1,840 71

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure 1st July, 1867, to 31st Oct., 1913.	Expenditure Fiscal Year ending 31st Oct. 1914.	Total Expenditure to 31st October, 1914.
PUBLIC BUILDINGS—*Continued.*			
SUDBURY DISTRICT:	$ c.	$ c.	$ c.
Court House and Gaol, and Registry Office, Sudbury	81,680 45	1,169 69	82,850 14
Lock-up at Sudbury	12,595 48	.....	12,595 48
" Chelmsford	1,015 78	.....	1,015 78
" Massey	702 74	1,000 00	1,702 74
" Nairn	300 00	.....	300 00
" Webbwood	1,749 15	.....	1,749 15
Industrial Farm, Burwash	.....	14,626 70	14,626 70
" " " Compensation to settlers (Special Warrant)	.....	3,035 00	3,035 00
THUNDER BAY DISTRICT:			
Registry Office Lock-up, Court House, etc., Port Arthur	69,742 13	698 09	70,440 22
Lock-up at Fort William	9,723 90	.....	9,723 90
" Silver Islet	2,304 79	.....	2,304 79
" Nepigon	1,279 23	.....	1,279 23
" Schreiber	700 00	.....	700 00
" Superior Junction (Sioux Lookout)	1,159 04	.....	1,159 04
" White River	499 77	.....	499 77
Industrial Farm, Fort William	39,388 36	32,317 62	71,705 98
" Additional Buildings	.....	5,680 30	5,680 30
" Purchase of Live Stock (Special Warrant)	.....	2,480 31	2,480 31
TEMISKAMING DISTRICT:			
Lock-up, Cobalt	5,418 99	170 50	5,589 49
" Cochrane	1,000 00	.....	1,000 00
" Charlton	500 00	.....	500 00
" Englehart	975 00	.....	975 00
" Gowganda	3,105 07	.....	3,105 07
" New Liskeard	657 00	.....	657 00
" North Porcupine (from Nipissing)	2,671 18	.....	2,671 18
" North Porcupine (from Sudbury)	138 80	.....	138 80
" South Porcupine	5,912 56	52 76	5,965 32
" Matheson	1,263 86	.....	1,263 86
Temporory Court House Haileybury	2,781 31	2,500 00	5,281 31
New Court House, Haileybury	12,873 51	48,461 66	61,335 17
New Registry Office, Haileybury	6,200 11	8,453 00	14,653 11
COUNTY OF HALIBURTON:			
Registry Office at Minden	5,918 42	.....	5,918 42
Gaol and Court House at Minden (grant)	1,000 00	.....	1,000 00
Lock-up at Gooderham	.....	200 00	200 00
Public Buildings	18,149,321 95	1,922,557 92	20,061,889 87

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure 1st July 1867, to 31st Oct., 1913.	Expenditure Fiscal Year ending 31st Oct., 1914.	Total Expenditure to 31st October, 1914.
	$ c.	$ c.	$ c.
PUBLIC WORKS:			
Admaston Bridge, Bonnechere River	1,977 97	1,246 61	3,224 58
Admaston, Ninth Concession Bridge	.....	399 83	399 83
Ansonia Bridge Lefroy	.....	3,277 42	3,277 42
Antoine Creek Bridge, Tp. of Mattewan	3,223 36	.....	3,223 36
Ardock Bridge, County of Frontenac	900 00	.....	900 00
Aubrey and Ignace Bridges	881 02	.....	881 02
Axe Creek, Housey's Outlet and Kahshee Bridges	1,221 57	.....	1,221 57
Balsam and Cameron Lakes Locks	23,959 02	.....	23,959 02
Balsam River Works	16,585 11	.....	16,585 11
Bangor, Wicklow and McClure Bridges	.....	399 25	399 25
Barbette Creek Bridge, Clara	993 92	.....	993 92
Bar River Bridge, Laird and McDonald	.....	394 21	394 21
Bar River Tp., McDonald (removing obstructions)	130 55	.....	130 55
Bass Creek Bridge, Tp. Limerick	1,200 00	.....	1,200 00
Bass Lake Dam, Tp. Galway, Peterborough	1,000 00	.....	1,000 00
Baysville Bridge (McLean and Ridout)	2,947 50	.....	2,947 50
Bear Creek Dam and Slide	1,617 52	.....	1,617 52
Beauchamp Townline Bridge	.....	598 17	598 17
Beaudette River (to aid in dredging etc.)	3,000,00	.....	3,000 00
Beaver Creek Bridge Kenora District	784 68	.....	784 68
Beaver Creek Bridge, Monck Tp.	996 77	.....	996 77
Beeline Bridge Alice Tp.	499 63	.....	499 63
Bell's Rapids Bridge, County Renfrew	2,494 79	.....	2,494 79
Bell's Settlement Bridge, Croft Tp.	.....	286 33	286 33
Bens River and Black Creek Bridges	2,132 24	.....	2,132 24
Berriedale Bridge, Tp. Armour	935 77	.....	935 77
Big East River and Black Creek Bridges, Chaffey	3,534 61	.....	3,534 61
Big East River Bridge	5,596 03	.....	5,596 03
Big Carp Bridge, Awengo (grant)	.....	700 00	700 00
Bigwood Bridges, Nipissing District	7,389 80	.....	7,389 80
Birch Creek Bridge, Sudbury, Soo Trunk Road	8,157 86	.....	8,157 86
Birch Creek Bridge, Birch Lake Road	4,285 27	.....	4,285 27
Bissett's Creek Bridge, Nipissing District	699 57	.....	699 57
Black Creek Bridge, Himsworth Tp.	449 33	.....	449 33
Black Creek Bridge Robertsville	149 05	.....	149 05
Black Creek Bridge, Dalton Tp.	5,028 49	.....	5,028 49
Black Donald Creek Bridge, Brougham	.....	250 00	250 00
Black Bay Road Bridge, Port Arthur	5,000 00	.....	5,000 00
Black Creek, removing obstructions, Tps. Monck and Watt	1,480 76	.....	1,480 76
Black Creek Bridge, Tp. Palmerston	250 00	.....	250 00
Black Duck and Indian River Bridges	869 48	.....	869 48
Black Bridge, Muskoka	1,500 00	.....	1,500 00
Black River Bridge, Matheson	3,938 68	.....	3,938 68
Black River Works (Lake Simcoe)	3,136 10	.....	3,136 10
Black River Bridge, Tp. Draper, Muskoka (to rebuild)	509 48	.....	509 48
Black Sturgeon Bridge	1,179 10	.....	1,179 10
Black Sturgeon Bridge Mellick	.....	939 05	939 05
Blanche River Bridge, High Falls	2,882 33	.....	2,882 33
Blanche River Bridge Marter Tp.	3,153 54	.....	3,153 54
Blind River Bridge	2,772 34	.....	2,772 34

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure 1st July, 1867, to 31st Oct., 1914.	Expenditure Fiscal Year ending 31st Oct., 1914.	Total Expenditure to 31st Oct., 1914.
PUBLIC WORKS—*Continued.*	$ c.	$ c.	$ c.
Blind River Bridge, Soo Trunk Road	8,081 21		8,081 21
Boda Creek Bridge, Shakespeare		389 79	389 79
Boon Creek Bridge	2,276 72		2,276 72
Bonnechere Bridge, Algoma (conditional)		2,500 00	2,500 00
Bonnechere River Bridge, Bromley Tp.	2,566 38		2,566 38
Bonnechere River Bridge, Horton Township (grant)	1,000 00		1,000 00
Bonnechere River Works	338 50		338 50
Boston Creek Bridge	1,332 95		1,332 95
Bottle Lake Dam and Mississicua Creek Dam	4,068 72		4,068 72
Boyne Bridges, Foley	2,160 98		2,160 98
Breakwater at Union, South Essex		2,453 43	2,453 43
Brower Creek Bridge, Tp. of Glackmeyer	240 00		240 00
Bruce Mines Bridge		305 20	305 20
Brule Creek Bridge	489 85		489 85
Bracebridge Bridge	7,000 00		7,000 00
Bucklake Bridge	305 06		305 06
Bunting Creek Bridge	586 13		586 13
Burk's Falls Bridge, Magnetawan River	2,606 14		2,606 14
Burnt River Bridge, Tp. Snowdon	2,017 11		2,017 11
Burnt River Bridge, Tp. Somerville	4,930 61		4,930 61
Burnt River Bridge Buckhorn Road	3,140 78		3,140 78
Burnt Bridges, Vermilion River, Tp Capreol	2,317 87		2,317 87
Bushkong Lake Bridge, Paterson Road	3,386 92		3,386 92
Bushkong Lake Bridge, Tp. Stanhope	3,030 91		3,030 91
Cache Creek Bridge, Springer Tp.	344 27		344 27
Calabogie Bridge, Tp. Bagot	1,800 00		1,800 00
Campement D'Ours Island Bridge	4,970 09		4,970 09
Canard River Bridge	1,000 00		1,000 00
Cardiff, Monmouth Townline and Maxwell Bridges	3,723 24		3,723 24
Cardiff-Monmouth Townline Bridge		597 53	597 53
Cardwell and Baxter Bridges	2,108 64		2,108 64
Carlow-Papineau Bridge, Con. 13		794 88	794 88
Casey-Brethour Bridge, Blanche River		6,033 16	6,033 16
Cashmere Dam, Middleesex	1,144 19		1,144 19
Cassimer River removing obstructions	205 56		205 56
Chapleau Bridge	2,231 40		2,231 40
Chippawa Creek Bridge, Widdifield		1,842 38	1,842 38
Chemong Lake Bridge	3,500 00		3,500 00
Christian's Creek Bridge, grant to Fenelon		200 00	200 00
Clare River Bridge, Sheffield	747 33	1,497 68	2,245 01
Clark's Bridge, grant to Kennebec		600 00	600 00
Clear Creek Bridge, Orford Tp.	500 00		500 00
Clearing and Log Houses on free land grants, Settlers' Homestead Fund	16,780 75		16,780 75
Clyde River Bridge, grant to South Canonto		499 00	499 00
Commanda Lake Bridge	465 95		465 95
Corbett Creek Bridge, Oliver	1,598 16	76 78	1,674 94
Completing Pumping Plant, Jordan Harbour (transferred to Public Buildings, $761.23)			
Cobb's Lake Outlet	1,102 08		1,102 08
Concrete Mixing Machine	950 00		950 00
Cosby Bridge, Nipissing District	493 85		493 85
Couchiching Lake Works	427 82		427 82
Creighton Vermilion Bridge		398 74	398 74
Crocodile Creek, Nipissing District	780 94		780 94

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure 1st July, 1867, to 31st Oct., 1913.	Expenditure Fiscal Year ending 31st Oct., 1914.	Total Expenditure to 31st Oct., 1914.
PUBLIC WORKS—*Continued.*	$ c.	$ c.	$ c.
Cull's, Barry Bay and Calabogie Bridges ...	931 48	.....	931 48
Dack-Sunday Creek Bridge	.....	259 78	259 78
Dacre Bridge, Brougham Tp.	395 63	.....	395 63
Damage by rising waters near Kenora	800 00	.....	800 00
Dausey Bridge at Blind River, Algoma	4,048 85	.....	4,048 85
Dawson Road Bridge	1,480 36	.....	1,480 36
Dean Lake and Thompson Road Bridge, Algoma District	.....	421 85	421 85
Dee Bank Bridge, Watt Tp., Muskoka Dist..	.....	1,998 28	1,998 28
Deep Bay Narrows improvement	248 35	.....	248 35
Deer Lake Works, dam and slide, Tp. Anstruther	1,420 17	.....	1,420 17
Delta Creek, Improvements	99 24	.....	99 24
Denbigh Bridge, Hydes Creek	847 25	924 93	1,772 18
Desbarats Bridge, Algoma	789 52	.....	789 52
Des Joachim Rapids Bridge and approaches	9,937 72	.....	9,937 72
Detola Branch Road Bridge	200 00	.....	200 00
Docks at Southampton Saugeen River.....	1,739 04	.....	1,739 04
Docks on the Rainy River	3,163 44	.....	3,163 44
Docks (landing) at Beaudraul's Wabigoon.	777 95	.....	777 95
Dog Lake Dams, storage of water	73,358 50	.....	73,358 50
Dickson Creek Bridge, Bucke Tp.	1,564 01	.....	1,564 01
Dorset Bridge, Tp. Dorset	7,621 72	.....	7,621 72
Draper Bridge	500 00	.....	500 00
Driftwood Bridges, Tp. Walker	2,195 89	.....	2,195 89
Dryden Bridge	7,420 93	.....	7,420 93
Dymond and Harris Townline Bridge	911 28	.....	911 28
Dunsford Bridges, Verulam (grant)	.....	200 00	200 00
Eagle Lake Dam, Anstruther Tp.	1,173 84	.....	1,173 84
Eau Claire Bridge	5,534 13	.....	5,534 13
Eaton Tp. Wabigoon Bridge	.....	1,185 90	1,185 90
Echo River Bridge	1,332 11	.....	1,332 11
Echo Bay Bridge	7,883 33	.....	7,883 33
Eels Creek Bridge, Co. Peterboro	1,500 00	.....	1,500 00
Emily Creek Bridge	2,389 29	.....	2,389 29
Embankment along River, Dover Tp.	500 00	.....	500 00
Englehart Bridge and approaches	2,795 39	.....	2,795 39
Equipment, instruments, machinery etc. ...	16,437 77	2,986 30	19,424 07
Espinola Bridge	17,980 23	.....	17,980 23
Expenses, supervising foremen	.....	991 02	991 02
Faulkner Bridge Monetteville, Lake Nipissing	589 47	.....	589 47
Fawcetts, Stephenson Townline and Kahshee River Bridges	2,877 66	.....	2,877 66
Fifth Concession Bridge, Wabi, Dymond	.....	1,499 17	1,499 17
Filistrault Lake Bridge, boundary between Martland and Crosby	1,394 91	.....	1,394 91
Finlay's Bridge, Echo River, Kehoe	.....	499 41	499 41
Forsyth's Creek Bridge, Tp. Christie	519 45	.....	519 45
Fourth Concession Bridge, Hagar	1,058 51	.....	1,058 51
Frog Creek Bridge, McIrvine Tp.	497 93	.....	497 93
Frontenac County, to rebuild bridges destroyed by fires, Clyde River, Mud Lake and Con. 1, Clarendon	3,288 06	.....	3,288 06
Gananoque River Improvement	366 23	.....	366 23
Gannons Narrows Bridge, contribution	1,000 00	.....	1,000 00
Garden River Bridge, Trunk Road	8,016 95	4,758 79	12,775 74
Gardener Lake Bridge, Hagerman Tp.	399 72	.....	399 72
Georgian Bay Works	7,149 97	.....	7,149 97

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure 1st July, 1867, to 31st Oct., 1913.	Expenditure Fiscal Year ending 31st Oct., 1914.	Total Expenditure to 31st October, 1914.
PUBLIC WORKS—*Continued.*	$ c.	$ c.	$ c.
Gillies Tp. Bridges	.....	472 03	472 03
Glenelg Bridges	1,000 00	.....	1,000 00
Gooderham and Kinmount Bridges	3,876 79	.....	3,876 79
Golden Lake Bridges	4,645 99	.....	4,645 99
Gold Rock Portage Bridges	1,001 93	.....	1.001 93
Gough's Bridge Himsworth Tp.	.....	800 00	800 00
Goulais Bay Road Bridges	1,559 76	.....	1,559 76
Goulais River Bridge	7,448 51	.....	7,448 51
Grass River Bridge, Stanhope	.....	281 55	281 55
Grassy River Bridge, McCrosson Tp..	1,325 32	.....	1,325 32
Graces Creek Bridge	874 25	.....	874 25
Gratuity to Arthur Brown, injured at Tomstown Bridge	140 00	.....	140 00
Great Northern Road Bridge, Plummer	.....	362 75	362 75
Griffith's Bridge, repairs, account 1912-13..	.....	247 50	247 50
Gull and Burnt River Works, dams, slides, bridges, etc.	100,716 60	.....	100,716 60
Haliburton Bridges, Tp. Dysart	2,000 00	.....	2,000 00
Hawkers Creek Bridge, Verulam Tp. grant, 1910	200 00	.....	200 00
Head River improvements, Tps. Laxton and Cardon	976 82	.....	976 82
Helferty Bridge, Raglan	380 00	.....	380 00
High Falls, Pigeon River, slide, dam, etc. ..	9,706 07	.....	9,706 07
High Falls Bridge Tp. Macaulay	1,730 37	.....	1,730 37
Hilliardton Bridge, over White River	5,460 89	.....	5,460 89
Himsworth Bridges	806 29	.....	806 29
Hoeffler Bridge	3.477 20	.....	3,477 20
Hoodstown Road Bridge, Chaffey Tp.	1,200 00	.....	1,200 00
Hoodstown Road Bridge, over Big East River	800 00	.....	800 00
Hog Creek and North River Bridges	.....	3,487 66	3,487 66
Houles and Black Creek Bridges, Salter	.....	3,496 71	3,496 71
Houseys Rapids Bridge	3,565 03	.....	3,565 03
Hudson Creek Bridge, Tp. Kearns	1,792 94	.....	1,792 94
Hymers Bridge, Whitefish River	3.000 05	.....	3,000 05
Indian Point Bridge. Manitoulin Island	6.876 49	.....	6,876 49
Indian River Works (deepening), Tps. Sarawak and Keppell	1 850 82	.....	1,850 82
Ingoldsby Bridge	299 94	.....	299 94
Inkerman Dam, removal of, County Dundas	1,000 00	.....	1,000 00
Jean Baptiste Bridge	98 31	.....	98 31
Jean Baptiste Bridge 3rd Con., Armstrong..	2,130 85	464 23	2,595 08
Jean Baptiste River, construction of bridge over, 4th Con. Armstrong	2,850 00	.....	2,850 00
Joseph River Bridge, Medora	1.756 07	.....	1,756 07
Judge Bridge, White River, Tp. of Casey ..	7,755 22	2,206 59	9.961 81
Kabuska Creek Bridge, Bonfield	4,980 20	.....	4,980 20
Kahshee, Morrison and Doe Lake Road Bridges	3,165 50	.....	3,165 50
Kahshee and Maxwell Bridges	.....	269 00	269 00
Kaministikwia River Works	22,865 02	.....	22,865 02
Kaministikwia Bridge, Paipoonge	37,553 97	.....	37,553 97
Katrine Bridge, Armour Tp.	1,257 23	.....	1,257 23
Kearney Bridge	6,798 82	.....	6,798 82
Kerr's Bridge Co. Victoria	2,531 83	.....	2.531 83
Kinmount Bridge	1,500 00	.....	1,500 00
Kushog Lake Dam	300 00	.....	300 00

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure 1st July, 1867, to 31st Oct., 1913.	Expenditure Fiscal Year ending 31st Oct., 1914.	Total Expenditure to 31st October, 1914.
PUBLIC WORKS—*Continued.*	$ c.	$ c.	$ c.
Lake of the Woods outlet (Kenora) to construct steel bridge	26,455 82	.....	26,455 82
L'Amable Bridge Dungannon Tp.	1,271 43	.....	1,271 43
La Blanche River Bridge and approaches	5,817 72	.....	5,817 72
La Blanche River Bridge	2,929 87	.....	2,929 87
La Blanche Bridge Tomstown	6,326 68	.....	6,326 68
La Blanche Bridge, Townline Marter Tp. (Special Warrant)	.....	4,979 55	4,979 55
La Grasse Bridge	1,500 00	.....	1,500 00
Lake of Bays, dredging mouth of river at outlet of	581 82	.....	581 82
Lake Nosbonsing Bridge, Nipissing District	3,497 68	.....	3,497 68
Lake Scugog Works, dredging at Port Perry	977 53	.....	977 53
Lake Scugog Flats Road	1,500 00	.....	1,500 00
Lake St. John and Sucker Creek, improving outlet	1,795 56	.....	1,795 56
Laird Township Bridges	1,693 22	.....	1,693 22
Lanark County, allowance for washout	1,225 00	.....	1,225 00
Landing Pier at Port Elgin	2,750 00	.....	2,750 00
Landing Pier at Southampton	2,022 63	.....	2,022 63
Larder Lake Road Bridges	1,219 81	.....	1,219 81
La Valley River Bridge, Woodyatt	2,374 62	.....	2,374 62
La Vase and Boon Creek, improvements to	804 22	.....	804 22
Lawrence Bridge, Gould Road	500 00	.....	500 00
Leeburn Bridge, Aberdeen	2,174 43	2,604 06	4,778 49
Lee Valley Bridge, LaCloche Creek, Algoma District	.....	2,890 78	2,890 78
Little Rapids Bridge, Little Thessalon	2,496 97	764 11	3,261 08
Little Serpent Bridge Victoria	.....	390 13	390 13
Lockington Bridge, Lash	.....	2,182 57	2,182 57
Madawaska Village Bridge	1,319 00	.....	1,319 00
Madawaska River Bridge, near Arnprior	3,000 00	.....	3,000 00
Madawaska River Swing Bridge at Combermere, Bridge at Burnston and Bridge Tp. Raglan	12,171 43	.....	12,171 43
Madawaska River Bridge, Airy Tp.	3,498 38	.....	3,498 38
Madawaska River Bridge, Murcheson Tp.	2,981 13	.....	2,981 13
Magnetawan Works, lock, swing bridge, dam and river improvements; dam and slide, Deer Lake; swing bridge, Tp. Ryerson; dredging Burks Falls and removing obstructions Ahmic Lake	76,778 26	.....	76,778 26
Magnetawan River Bridge, Perry Tp.	3,469 47	.....	3,469 47
Magnetawan River Bridge Burk's Falls	16,002 30	.....	16,002 30
Magpie River Bridge	489 28	.....	489 28
Maintenance and Repairs, locks, dams, slides, bridges, etc., (exclusive of salaries)	401,980 17	31,220 04	433,200 21
Manitou Lake Works, dam at outlet, etc., Rainy River District	2,794 14	.....	2,794 14
Manitoulin Bridges	.....	894 41	894 41
Manitowaba Bridge, McKellar Tp.	798 51	.....	798 51
Maple Island Bridge, Magnetawan River, Tp. McKenzie	993 32	.....	993 32
Mary's and Fairy Lakes Lock Works and bridge over Muskoka River at Huntsville	80,438 37	.....	80,438 37

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure, 1st July, 1867, to 31st Oct., 1913.	Expenditure Fiscal Year ending 31st Oct., 1914.	Total Expenditure to 31st Oct., 1914.
PUBLIC WORKS—*Continued.*	$ c.	$ c.	$ c.
Mary's and Fairy Lake Lock Works to renew high bridge above lock over Muskoka River and renew cribbing above and below locks	8,389 39	.....	8,389 39
Martland Township Bridge	1,192 90	.....	1,192 90
Maskinonge Creek, Tp. Cassimer, removing obstructions	499 92	.....	499 92
Matawatchin Bridge, Renfrew Co.	8,485 67	.....	8,485 67
Mattawa River Bridge and Works	22,094 02	.....	22,094 02
Mill Creek improvements, Co. of Prescott	1,000 00	.....	1,000 00
Minden Bridge	4,740 68	.....	4,740 68
Minnitake Bridge	552 34	.....	552 34
Mississauga Bridge, Thompson Tp. (A. Baker, Compensation for cow)	.....	75 00	75 00
Mississauga River Bridge, Thompson Tp.	24,593 87	.....	24,593 87
Mississauga River, reflooring iron bridge	462 60	.....	462 60
Mississicua Lake Dam	4,989 84	.....	4,989 84
Mississicua River Bridge	4,355 94	.....	4,355 94
Mississippi River, McKenzie and Egan Bridges	2,125 26	.....	2,125 26
Mississippi River improvements (obstructions)	7,343 08	.....	7,343 08
Mississippi River, Monro's Rapids, removing obstructions	900 00	.....	900 00
Moira River improvements, Tp. Thurlow	2,135 32	.....	2,135 32
Monck Road Bridge, etc., Cardiff	774 03	.....	774 03
Montreal River Bridge, Elk Lake	7,845 19	.....	7,845 19
Moose River Works, Co. Stormont	1,000 00	.....	1,000 00
Morley Township Bridge	742 28	.....	742 28
Mountain Lake Bridge, Minden	1,345 43	794 59	2,140 02
Mud Creek Bridge, Tp. Herschell	1,800 00	.....	1,800 00
Mud Creek Bridge, Portland	.....	1,000 00	1,000 00
Mud Lake Works, Tp. Dalton	1,502 32	.....	1,502 32
Mumfords Bridge, Distress River, Tp. Chapman	2,202 01	.....	2,202 01
Muskoka Lake Works	21,915 30	.....	21,915 30
Muskoka Lakes, Lock, bridges and dredging at Port Carling	64,683 45	.....	64,683 45
Muskoka Lakes, Cut and bridge at Port Sandfield	20,336 05	.....	20,336 05
Muskoka, South Channel Bridge and Dam, Bala	5,182 95	2,424 75	7,607 70
Muskoka Lake, Muskosh Falls, dams and bridges at Bala	23,567 03	.....	23,567 03
Muskoka, Joseph River Works (less contribution)	486 87	.....	486 87
Muskoka, Kemp's Channel, improvements	4,238 69	.....	4,238 69
Muskoka, Piers and boom, Jeannette's Channel	1,660 75	.....	1,660 75
Muskoka River Works	42,670 53	.....	42,670 53
Muskoka River Bridge at South Falls	1,000 00	.....	1,000 00
Muskoka River Bridge at Port Sydney	1,000 00	.....	1,000 00
Muskoka River, Port Sydney Dam	.....	4,668 94	4,668 94
Muskoka Road Bridge, Koshie Creek	.....	2,746 40	2,746 40
Muskrat River Improvements	1,861 98	.....	1,861 98
Myers Cave Bridge, Barrie Tp.	931 38	.....	931 38
McCarthy Creek Bridges, Tp. Gibbons	300 00	.....	300 00
McCreight's Bridge, Kirkwood Tp.	5,639 82	.....	5,639 82
McKelvery Creek Bridge, Crozier	1,837 67	.....	1,8 7739

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure 1st July 1867, to 31st Oct., 1913.	Expenditure Fiscal Year ending 31st Oct., 1914.	Total Expenditure to 31st Oct., 1914.
PUBLIC WORKS—*Continued.*	$ c.	$ c.	$ c.
McKellar Village Bridge, Parry Sound District	.....	942 28	942 28
McKenzie Creek improvement	200 35	.....	200 35
Nation River Works	13,877 23	.....	13,877 23
Nation River Dredge (contribution)	4,000 00	.....	4,000 00
Nation River Bridge, 9th and 10th Cons. Cambridge Tp. (grant)	1,000 00	.....	1,000 00
Nation River Bridge, Casselman and Cambridge Tps. (grants)	2,000 00	.....	2,000 00
Neighick Lake, dredging at entrance	898 15	.....	898 15
Neebing River Bridge, Neebing Tp.	1,800 00	.....	1,800 00
New Liskeard Bridge, Wabis River	4,000 00	.....	4,000 00
Nipissing Lake Works	9,182 17	.....	9,182 17
Nogies Creek Works	2,144 57	.....	2,144 57
Norland Bridge, Cameron Road	1,354 70	.....	1,354 70
Northwest Arm Bridge	999 68	.....	999 68
North Branch Bridge, Longford	753 35	.....	753 35
North and Black Rivers, removing obstructions	4,535 13	.....	4,535 13
North Road Bridge, Tp. Dymond	1,877 24	.....	1,877 24
North River Bridge, Matchedash	5,526 65	.....	5,526 65
North River, to pay for stock injured by blasting	135 00	.....	135 00
Nottawasaga River Works	9,270 83	.....	9,270 83
Nuggett Creek Bridge, Kenora District	963 29	.....	963 29
Obstacles removed from navigable streams.	513 02	.....	513 02
Oakley Bridge, Muskoka	4,765 03	.....	4,765 03
O'Connor Tp. Bridges	.....	849 72	849 72
Omo Creek Bridge, Pembroke and Mattawa Road	.....	2,927 80	2,927 80
Onaping River Bridge	2,710 09	.....	2,710 09
Opickinimika River Dams	1,995 33	.....	1,995 33
Orillia Township Bridge	2,494 15	.....	2,494 15
Orillia Township Bridge, to complete grade	.....	500 00	500 00
Otonabee River Works	9,162 91	.....	9,162 91
Otonabee River Bridge	2,500 00	.....	2,500 00
Otter Creek Bridge at Copp's Falls	426 32	.....	426 32
Otter Creek Bridge, Casey-Brethour Town line	1,112 12	943 73	2,055 85
Overhead bridges, Soo branch, C.P.R.	11,070 17	.....	11,070 17
Oxdrift Bridge, Kenora District	656 90	.....	656 90
Oxtongue Bridge, Muskoka District	1,058 26	.....	1,058 26
Palmer's Rapids Bridge, Renfrew	4,629 11	.....	4,629 11
Papineau Bridges, Boon Creek	3,074 28	11 60	3,085 88
Payne River Bridges, Tp. Finch	2,500 00	.....	2,500 00
Payne River Works	4,000 00	.....	4,000 00
Pautois Creek Bridge, Calvin Tp.	2,373 82	.....	2,373 82
Pearson Tp. Bridges	.....	792 33	792 33
Peninsula Canal Bridge, Fairy Lake	.....	4,148 55	4,148 55
Peninsula Creek improvements, bridges, cribbing, etc.	37,495 16	.....	37,495 16
Petawawa River Bridge	3,879 25	.....	3,879 25
Peterson, Beaumaris and Cardwell Bridges.	4,311 57	.....	4,311 57
Pickerel River improvement, Parry Sound District	1,391 84	2,722 76	4,114 60
Pickerel River Bridge, Wilson Tp.	1,846 46	.....	1,846 46
Pigeon River Works, Co. Victoria	4,999 62	.....	4,999 62
Pinewood Bridge, Rainy River District, reflooring	375 00	.....	375 00
Pine River Bridge, Dilke Tp.	1 522 65	.....	1,522 65

STATEMENT No. 2.—Continued.

Name of Work.	Expenditure 1st July 1867, to 31st Oct. 1913.	Expenditure Fiscal Year ending 31st Oct., 1914.	Total Expenditure to 31st Oct., 1914.
PUBLIC WORKS—*Continued.*	$ c.	$ c.	$ c.
Pine River Bridge, Rainy River District ..	3,241 30	.....	3,241 30
Portage Bay Bridge, Keewatin	5,009 50	.....	5,009 50
Portage du Fort Bridge, Ottawa River ...	10,747 99	.....	10,747 99
Port Severn, Axe Lake and Cooper Bridges	1,427 41	.....	1,427 41
Poverty Lake Bridge, Monmouth	.....	406 11	406 11
Powassan Bridge	300 00	.....	300 00
Radcliffe Bridge	.....	399 53	399 53
Rainy River Road Bridge	4,429 84	.....	4,429 84
Rainy River Bridge	1,996 77	.....	1,996 77
Rates Bridge, Thessalon River	.....	959 08	959 08
River Valley Bridge, Sturgeon River	.....	843 76	843 76
Roads, Tp. Ryerson	7,295 06	.....	7,295 06
Root River Bridge, Tarentorus Tp., 4th Con. and 6th Con.	3,201 50	1,056 23	4,257 73
Root River Bridge, Soo Trunk Road	8,217 90	.....	8,217 90
Rose and Plummer Township Bridges	.....	497 50	497 50
Rossport Bridge, Thunder Bay District ..	881 75	.....	881 75
Round Lake Bridge, Hagarty	500 00	.....	500 00
Round Lake Road bridges	2,301 90	.....	2,301 90
Rubber boots, purchase of	122 95	128 43	251 38
Running Creek, dredging	1,500 00	.....	1,500 00
Rydal Bank Bridge	10,141 70	.....	10,141 70
Ryerson Town line Bridge, Sprucedale Road	963 30	.....	963 30
Salter and Victoria Bridges	499 38	.....	499 38
Sampsons and Sparks Creek Bridge, Bonfield	1,444 02	2,484 82	3,928 84
Sand Lake Road Bridge, Magnetawan River	2,832 15	986 66	3,818 81
Sakoose Bridges	947 68	.....	947 68
Sauble River Bridge, Massey	12,708 20	.....	12,708 20
Saugeen River Bridge, Bentinck Tp.....	900 00	.....	900 00
Scugog River Works (including Lindsay lock and swing bridges)	97,897 38	.....	97,897 38
Seguin River Bridge, Christie	3,754 00	1,955 89	5,709 89
Severn River Bridge, Tp. Morrison	3,350 00	.....	3,350 00
Severn River Bridge, East Branch, Rama Tp.	1,990 00	.....	1,990 00
Shadow River Bridge, Tp. Humphrey	490 90	.....	490 90
Shallow Lake and Wabigoon Bridges	.....	3,120 12	3,120 12
Sherbineau Bridge, Hungerford	500 00	.....	500 00
Shoal Lake, and Lake of the Woods, improvement Ash Rapids	5,998 25	.....	5,998 25
Six Mile Bridge, Shuniah	1,417 71	1,433 25	2,850 96
Slate River Bridge, Kaministiquia River ..	580 14	.....	580 14
Sleeman's Bridge and approaches	1,044 80	.....	1,044 80
Snake River improvements	140 65	.....	140 65
South River Bridge, Nipissing Tp.	5,846 00	.....	5,846 00
South River and Eagle Lake Bridges, Tp. Machar	1,295 87	.....	1,295 87
South River Bridge, Himsworth Tp.	1,937 30	.....	1,937 30
Spanish River Bridge and approaches, Webbwood	18,364 73	.....	18,364 73
Spanish River Bridge, Massey	28,723 08	.....	28,723 08
Spanish River Bridge, grant to Nairn Tp..	1,000 00	.....	1,000 00
Spanish River Bridge, Nairn Tp.	14,302 78	.....	14,302 78
Squaw River Works	1,688 16	.....	1,688 16
Squaw River Works, dam at Harvey	581 56	.....	581 53
Stanley Bridge, Thunder Bay District	8,136 09	6 80	8,142 89

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure 1st July, 1867, to 31st Oct., 1913.	Expenditure Fiscal Year ending 31st Oct., 1914.	Total Expenditure to 31st Oct., 1914.
	$ c.	$ c.	$ c.
PUBLIC WORKS—*Continued.*			
Star Lake Works	412 22	.....	412 22
Steidtler Creek Bridge, Parry Sound District	954 47	.....	954 47
Stephenson Float Bridge	808 15	.....	808 15
Still River Bridge, Byng Inlet	918 60	.....	918 60
Stisted, Sharpes Creek and Hoc Bridges	2,537 28	.....	2,537 28
Stoney Creek Works, Tp. Ops	4,828 25	.....	4,828 25
Stoney Creek Bridge, Ryerson	831 68	.....	831 68
St. Joseph Tp. Bridge, Algoma District	1,288 98	.....	1,288 98
Sturgeon River Bridge, Tp. Field	3,616 08	.....	3,616 08
Sturgeon River Bridge, Tp. Gibbons	2,610 35	.....	2,610 35
Sturgeon Falls Bridge	11,596 08	7,095 43	18,691 51
Sturgeon Bridge, Mather & Dobie Townline	.....	358 33	358 33
Suddaby's Bridge, Johnson	1,794 79	81 71	1,876 50
Sunday Creek Bridge	603 00	.....	603 00
Sunday Creek Bridge, Dack	321 11	.....	321 11
Sunday Creek Bridge, Robillard	33 71	323 66	357 37
Surveys and Inspections, etc.	69,436 19	2,566 45	72,002 64
Swamp Creek Bridge, grant to Clarendon	.....	188 70	188 70
Swansons Creek Bridge, Van Horne	962 00	.....	962 00
Sydenham River Works	2,156 26	.....	2,156 26
Sylvester Bridge, Kirkpatrick	.....	724 71	724 71
Talbot River Works	605 95	.....	605 95
Thessalon and Earchwood Bridges	7,769 69	.....	7,769 69
Thessalon Road (horse killed)	225 00	.....	225 00
Tiers Bridge, Hawkers' Creek	200 00	.....	200 00
Toll Road, City of St. Thomas	3,000 00	.....	3,000 00
Toll Road, Hope Township, purchase of	2,300 00	.....	2,300 00
Toll Road, London and Port Stanley, Elgin County, purchase of	3,000 00	.....	3,000 00
Toll Road, Township of London, towards purchase of	3,666 00	.....	3,666 00
Tomstown Bridge, repairs	.....	400 00	400 00
Tory Hill Bridge	499 35	.....	499 35
Trenough Bridge, Rama	1,000 00	.....	1,000 00
Trent River Bridge and Works	2,000 00	.....	2,000 00
Tunnel Bridge, Wells Tp.	531 54	.....	531 54
Two Tree Bridge, St. Joseph's Island	1,802 95	10 00	1,812 95
Union Creek improvements	1,050 63	.....	1,050 63
Veuve River Bridge, Tp. Dunnet	918 70	.....	918 70
Veuve River Bridge, Tp. Kirkpatrick	541 06	.....	541 06
Veuve River Bridge, Hagar Tp.	997 95	.....	997 95
Veuve River Bridge, Markstay	3,229 82	.....	3,229 82
Veuve River Bridge, Tp. Verner	5,719 38	.....	5,719 38
Verner Bridge	1,163 11	.....	1,163 11
Vermilion River Bridge, Tp. Hanmer	662 75	.....	662 75
Vermilion River Bridge, Whitefish	18,840 63	.....	18,840 63
Vermilion River Bridge, Capreol	821 28	.....	821 28
Wabigoon Bridge	2,892 79	.....	2,892 79
Wabigoon Township Bridges	500 00	.....	500 00
Wabis River Bridges	2,773 33	.....	2,773 33
Wabis Creek, to construct bridge over	1,760 08	.....	1,760 08
Wabis River Works, Tps. Dymond, Harris and Kearns	1,340 51	.....	1,340 51
Wages and expenses, supervising foreman	2,022 12	2,851 50	4,873 62
Wahnapitae Log Canal	3,334 54	.....	3,334 54

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure, 1st July, 1867, to 31s. Oct., 1913.	Expenditure, Fiscal Year ending 31st Oct., 1914.	Total Expenditure, to 31st Oct., 1914.
PUBLIC WORKS—*Continued.*	$ c.	$ c.	$ c.
Wahnapitae River Bridge and approaches	4,642 49	.....	4,642 49
Walker River Bridge, Desbarats	1,470 86	.....	1,470 86
Warren Bridge, Veuve River	2,501 14	322 44	2,823 58
Wasdale Bridge, Ontario and Simcoe	1,000 00	.....	1,000 00
Washago Wharf	489 22	.....	489 22
Washago and Gravenhurst Road	32,792 12	.....	32,792 12
Watt, Ryde and Macaulay Bridges	4,094 98	.....	4,094 98
Waters Second Concession Bridge	.....	1,736 80	1,736 80
Wawa Road Bridge	1,198 39	.....	1,198 39
West Arm Bridge, Lake Nipissing	11,260 08	.....	11,260 08
West's Bridge, Thessalon River, Plummer Tp.	5,345 32	.....	5,345 32
West Channel Bridge floor, Kenora	962 84	.....	962 84
White Bridge, Mayo	.....	291 73	291 7
Whitefish River, removing obstructions	249 15	.....	249 15
White River Bridge, Pacaud boundary	3,423 97	.....	3,423 97
White River Bridges and approaches, Marter Tp.	3,185 45	.....	3,185 45
White River Bridge, Bellingham	6,937 27	.....	6,937 27
Whitefish Bridge, Lybster	499 45	.....	499 45
Whitestone Bridge, McKenzie Tp.	1,821 16	.....	1,821 16
Whitestone Lake Bridge, Parry Sound District	706 40	.....	706 40
Widdifield Bridges	528 16	1,604 74	2,132 90
Wilno and Rockingham Bridges	499 34	.....	499 34
Winnipeg River Bridge, Pellatt Tp.	11,039 99	.....	11,039 99
Wissi-Wassa Bridge, Himsworth Tp.	1,745 60	.....	1,745 60
Wollaston Tp. Bridge	765 73	.....	765 73
Wolsley River Bridge, Mattawa Tp.	974 20	.....	974 20
Wolsley Bridge, Guy's Hill, Martland	.....	993 12	993 12
Wright's Creek Bridge, Tp. Casey	1,813 35	.....	1,813 35
Wye River Works	5,176 98	.....	5,176 98
York Branch River Bridge, Tp. Dungannon	1,910 31	.....	1,910 31
Young's Point Lock	31,192 72	.....	31,192 72
DRAINAGE WORKS:			
Algoma District Road drainage	792 57	622 00	1,414 57
Allan Arcand, Mountain Tp.	2,200 00	.....	2,200 00
Aux Raisin River, Tps. of Osnabruck and Cornwall	7,000 00	.....	7,000 00
Baldwin Drain, Mountain Tp.	290 00	.....	290 00
Barkley Creek, Winchester Tp.	1,000 00	.....	1,000 00
Beaver Creek Drain, Cornwall Tp.	750 00	.....	750 00
Bear Lake Outlet, Macpherson (improving)	1,437 83	.....	1,437 83
Becquith Creek Drain, Cumberland and Clarence Tps.	1,000 00	.....	1,000 00
Big Creek Drain, Tps. West and North Tilbury	9,367 30	.....	9,367 30
Big Marsh Drainage, Pelee Island	2,000 00	.....	2,000 00
Black Creek, clearing Matchedash	496 91	.....	496 91
Bonfield Creek, improving	1,505 86	.....	1,505 86
Brethour Township Drainage	499 83	.....	499 83
Brooke Tp. Outlet Drain for Durham Creek	1,300 00	.....	1,300 00
Bromley Tp. Drainage Scheme	1,100 00	.....	1,100 00
Burnett Drain, Elma Tp.	1,500 00	.....	1,500 00
Capreol Drainage, Lots 5 to 10, 3rd Con.	800 00	.....	800 00
Capreol Tp. Drainage (grant)	399 86	.....	399 86

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure, 1st July, 1867, to 31st Oct. 1913.	Expenditure Fiscal Year ending 31st Oct., 1914.	Total Expenditure, to 31st Oct., 1914.
DRAINAGE WORKS—*Continued.*	$ c.	$ c.	$ c.
Carp River Drainage Scheme	2,000 00	.....	2,000 00
Castor Extension and 8th Con., Winchester	1,600 00	.....	1,600 00
Cavan Tp. Drainage Works	4,000 00	.....	4,000 00
Cobb Lake drainage, Clarence	.....	3,000 00	3,000 00
Collins Creek improvement	.....	396 51	396 51
Crow Lake Channel, improvement	.....	299 96	299 96
Dauphin Drainage Works, Tp. of Raleigh	5,000 00	.....	5,000 00
Dawn and Enniskillen Town line Drain	2,500 00	.....	2,500 00
Douro Drainage Works, Tp. Douro	1,200 00	.....	1,200 00
Eastnor Tp. Outlet Drain	2,480 00	.....	2,480 00
East Simcoe District Road, drainage	.....	500 00	500 00
Eldon Tp. Drainage	1,500 00	.....	1,500 00
Elma Tp. Drainage Works	4,000 00	.....	4,000 00
Elson and Crooked Creek Drainage Scheme, Tp. of Dawn	2,000 00	.....	2,000 00
Evanturel Tp. Drain	749 24	.....	749 24
Ferris Tp. Drain	500 00	.....	500 00
Fish Creek, improvement, Hinchinbrook	.....	388 71	388 71
Forbes Drainage Works, Tilbury East Tp.	2,000 00	.....	2,000 00
Fraser Creek Drainage, Tp. of Roxborough	300 00	.....	300 00
Hagarty Creek Drain, Euphemia and Mose Tps.	1,000 00	.....	1,000 00
Hardy Creek Drainage Works, Tp. of Adelaide	1,500 00	.....	1,500 00
Hardy Creek Drain, Tp. Metcalf	1,000 00	.....	1,000 00
Hardy Creek Drain, Warwick	225 00	.....	225 00
Harley Township Drainage	472 33	.....	472 33
Hanmer and Rayside Drainage	1,500 00	.....	1,500 00
Henry Marentette Drain, Sandwich	1,500 00	.....	1,500 00
Hilliard Tp. Drainage, 4th Con.	780 00	.....	780 00
Howick Tp. Drainage	300 00	200 00	500 00
John Taylor Drain, Marlborough and North Gower (grant)	1,000 00	.....	1,000 00
Kenyon, Charlottenburgh, Cornwall and Roxborough Tps. Drainage	700 00	.....	700 00
Lalonde Drainage Works, Roxborough	900 00	.....	900 00
Little Creek drain, Tilbury North	.....	2,000 00	2,000 00
Little River, Sandwich East	2,000 00	.....	2,000 00
Little Sauble Drain, Usborne Tp.	1,000 00	.....	1,000 00
Logan Northwest Drain, Tp. Logan	1,000 00	.....	1,000 00
Long Marsh drain, extension, Anderdon	1,500 00	1,500 00	3,000 00
Long Swamp Drainage Works (or Davidson), Tp. Keppell	1,500 00	.....	1,500 00
Louise Tp. drain, Lots 2 to 10, Con. 6	700 00	.....	700 00
Luther Tp. drainage	1,500 00	.....	1,500 00
Lyons Creek Drain, Humberstone (grant)	800 00	.....	800 00
Mad River improvement, (conditional)	.....	1,823 30	1,823 30
Manitoulin District Road drainage	750 54	722 12	1,472 66
Mara Tp. Drainage, Sucker Creek, etc.	1,902 35	39 37	1,941 72
Mara and Rama, drainage	.....	1,328 44	1,328 44
Maxwell Creek Drain, Chatham Tp. (grant)	4,000 00	.....	4,000 00
Medonte Tp. Drain	1,800 00	.....	1,800 00
Merrick Creek Drainage Works, South Sandwich Tp.	1,000 00	.....	1,000 00
Michener and Wignell, drain, Humberstone	.....	800 00	800 00
Miller Drain, Tp. Mountain	220 00	.....	220 00

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure 1st July, 1867, to 31st Oct., 1913.	Expenditure Fiscal Year ending 31st Oct., 1914.	Total Expenditure, to 31st Oct., 1914.
DRAINAGE WORKS—*Continued.*	$ c.	$ c.	$ c.
Miscellaneous Drainage	27 00	.....	27 00
Moira Lake Drainage, Huntingdon	1,000 00	.....	1,000 00
Monklands Drainage Scheme, Tp. Roxborough	1,200 00	.....	1,200 00
Mud Lake Drainage, Tp. Keppell	963 23	.....	963 23
Muskoka District Road, drainage	.....	483 63	483 63
McDonald Robertson Drain, Lochiel	1,500 00	.....	1,500 00
McFarlane Relief Drain, Dover	.....	4,000 00	4,000 00
McGregor Creek Works, Tp. Howard	2,000 00	.....	2,000 00
McIntyre Creek Drainage Works	2,200 00	.....	2,200 00
McLellan and Booth Creek Drain, Dawn	.....	1,000 00	1,000 00
Nesbitt and Rogers Drains, Tp. Bosanquet.	300 00	.....	300 00
Ninth Concession Drain, Brooke	.....	1,000 00	1,000 00
Nipissing District Roads, drainage	1,495 32	1,530 52	3,025 84
North Branch Drainage Works, Tps. Roxborough and Cornwall	2,000 00	.....	2,000 00
North Branch and McIntosh Drain, Roxborough (grant)	2,000 00	.....	2,000 00
North East Drain, Ellice and Logan	.....	1,000 00	1,000 00
Nottawasaga River Drainage	455 00	913 01	1,368 01
Parry Sound District, drainage	1,339 31	348 85	1,688 16
Pedan Drainage Works, Marlborough Tp.	1,000 00	.....	1,000 00
Pelee Point Marsh Drainage, Mersea (By-law 815)	5,000 00	1,500 00	6,500 00
Pelee Island Drainage	3,500 00	.....	3,500 00
Perche Drainage Scheme, Sarnia (grant).	1,500 00	.....	1,500 00
Petite, Castor River and Annabel Creek Drainage Works, Tp. Winchester	7,700 00	.....	7,700 00
Pickerel River improvement, Huntingdon (conditional)	.....	500 00	500 00
Pike Creek Drainage Scheme, Maidstone and Sandwich	2,000 00	.....	2,000 00
Pike Drainage Works, Tp. Tilbury East	2,000 00	.....	2,000 00
Pottawatomie River Drainage Works, Tp. Derby	3,500 00	.....	3,500 00
Pulse Creek Drain	1,500 00	.....	1,500 00
Rainy River Roads, Drainage	6,052 04	6,074 76	12,126 80
Rama Township Road, drainage	200 00	.....	200 00
Richmond Drain, Colchester South (grant)	1,500 00	.....	1,500 00
Running Creek, dredging west of 5 and 6 Side Road	3,500 00	.....	3,500 00
Ruscomb Drainage Works, Tp. Rochester	9,300 00	.....	9,300 00
Rusdale Creek, Bathurst Tp. drain	1,200 00	.....	1,200 00
Silver and Castor Works, Tps. Mountain, Osgoode, South Gower and Winchester	2,400 00	.....	2,400 00
Silver Creek and Castor River	1,600 00	.....	1,600 00
Snake River, Tp. Bromley	7,700 00	.....	7,700 00
South Branch Drain, Cornwall (grant)	3,000 00	.....	3,000 00
Spring Creek Drainage Works, Lochiel Tp.	2,000 00	.....	2,000 00
Springer Tp. Drain	610 00	.....	610 00
Springer Tp. Drain (Colonization Roads).	115 00	.....	115 00
Stewart Proulx Drain, Lochiel	.....	800 00	800 00
Stoney Creek Drain, Cornwall	.....	1,500 00	1,500 00
Sturgeon Falls District, drainage	997 93	999 84	1,997 77
Sudbury District, drainage	1,440 00	1,499 00	2,939 00
Sundry Drainage Works (charged to Municipalities)	329,980 93	.....	329,980 93

STATEMENT No. 2.—*Continued.*

Name of Work.	Expenditure 1st July, 1867, to 31st Oct., 1913.	Expenditure Fiscal Year ending 31st Oct., 1914.	Total Expenditure to 31st Oct., 1914.
DRAINAGE WORKS—*Continued.*	$ c.	$ c.	$ c.
Survey and Drainage swamp lands (Prov. acct.)	36,600 51	.....	36,600 51
Temiskaming District, drainage	2,497 81	2,117 64	4,615 45
Temiskaming Railway Survey	24,823 58	.....	24,823 58
Tilbury East, Outlet drain	3,020 00	.....	3,020 00
Toulouse Drain, Dover	.....	500 00	500 00
Van Camp Drainage Scheme	2,700 00	.....	2,700 00
West Luther drainage	.....	500 00	500 00
Whitebread Pumping Scheme, Dover	1,000 00	.....	1,000 00
Whitebread Drainage Works, Tp. Sombra.	4,000 00	.....	4,000 00
Public Works and Drainage	3,043,782 45	199,682 15	3,243,464 60
Colonization and Mining Roads	7,482,490 20	483,071 46	7,965,561 66
Good Roads—Highway Improvement	1,499,218 32	300,198 97	1,799,417 29
Aid to Railways	9,066,107 57	139,112 54	9,205,220 11
NOTE:			
Certificates issued to Railways $10,515,892 45			
Cash paid direct to Railways 2,223,362 42			
Aid granted 2,783.197 miles $12,739,254 87			
Certificates outstanding .. 3,534,034 76			
Actual cash expended to 31st October, 1914 ..... $9,205,220 11			
Totals	39,230,920 49	3,044,623 04	42,275,543 53
RECAPITULATION:			
Total Public Buildings	18,149,321 95	1,922,557 92	20,071,879 87
" Public Works and Drainage	3,043,782 45	199,682 15	3,243,464 60
" Colonization and Mining Roads	7,482,490 20	483,071 46	7,965,561 66
" Good Roads—Highway Improvement	1,499,218 32	300,198 97	1,799,417 29
" Aid to Railways	9,066,107 57	139,112 54	9,205,220 11
Grand Totals	39,240,920 49	3,044,623 04	42,285,543 53

Department of Public Works, Ontario.
Toronto, February, 1915.

J. P. EDWARDS,
Accountant, etc., Public Works.

STATEMENT No. 3.

Being a classified statement showing the expenditure on Capital Account for Public Buildings, Public Works, Colonization Roads, Good Roads (Highway Improvement), Aid to Railways, etc. (1) The total expenditure for thirty-seven years and six months, from the 1st of July, 1867, to the 31st of December, 1904; (2) The total expenditure for eight years and ten months from the 1st of January, 1905, to the 31st October, 1913; (3) The expenditure for one year to the 31st of October, 1914; and (4) The grand total expenditure from the 1st of July, 1867, to the 31st of October, 1914.

Name of work.	Expenditure 1st July, 1867, to 31st Dec., 1904.	Expenditure, 1st January, 1905, to 31st October, 1913.	Expenditure for year to 31st October, 1914.	Total Expenditure to 31st October, 1914.
	$ c.	$ c.	$ c.	$ c.
1. Hospitals for the Insane, etc., at Toronto, Whitby, Mimico, London, Hamilton, Kingston, Brockville, Orillia, Cobourg, Penetanguishene and Woodstock	4,774,584 48	1,818,381 87	729,335 52	7,322,301 87
2. Penal Institutions, viz., Reformatory for Females; Reformatory for Boys; Central Prison, Toronto; New Provincial Prison, Guelph; and Industrial Farms, Fort William, Sault Ste. Marie and Burwash	1,356,979 02	1,073,092 16	458,902 69	2,888,973 87
3. Educational Institutions, viz., The Ontario School for the Deaf, Belleville; The Ontario School for the Blind, Brantford; School of Practical Science, Toronto; Normal and Model Schools, at Toronto and Ottawa, Normal Schools at London, Stratford, Hamilton, Peterborough and North Bay, and Hygienic Building, London	1,791,329 68	1,003,538 10	208,220 36	3,003,088 14
4. Agricultural Institutions, viz., Ontario Agricultural College, Guelph; Winter Fair Building, Guelph; Fruit Experimental Station, Jordan Harbour; Dairy Schools, Kingston and Strathroy; Dairy Farm, Algoma; Farm, Mimico Ontario Veterinary College, Toronto; and Ontario Government Office Building, London, England	719,257 51	574,886 24	237,617 45	1,531,761 20
5. Buildings for Administration of Justice, being Osgoode Hall, Toronto, and Court Houses, Lockups, Registry Offices, etc., in the Districts of Algoma, Thunder Bay, Muskoka, Parry Sound, Nipissing, Manitoulin, Sudbury, Rainy River, Kenora and Temiskaming	455,731 09	636,564 57	145,618 30	1,237,913 96
6. Parliament and Departmental Buildings, and old and new Government House	1,776,474 75	2,137,602 87	139,179 92	4,053,257 54

STATEMENT No. 3.—*Continued.*

Name of work.	Expenditure 1st July, 1867, to 31st Dec., 1904.	Expenditure 1st January, 1905, to 31st October, 1913.	Expenditure for year to 31st October 1914.	Total Expenditure to 31st October 1914.
	$ c.	$ c.	$ c.	$ c.
7. Works for the improvement of Navigation, such as locks, dams, slides, etc., and works for the improvement of Transportation, such as bridges, piers, roads, etc	1,218,734 35	1,223,246 86	159,794 49	2,601,775 70
8. Drainage Works; Grants and Advances to Municipalities	418,161 85	144,181 43	39,887 66	602,230 94
9. Miscellaneous Expenditures, viz., Brock's Monument; Niagara River Fence; Clearing of Log Houses, Township of Ryerson; Temiskaming Surveys; Immigration Offices; Lodging House; Children's Shelter, Toronto; Fish and Game Department Boat Houses, Hatchery Building, etc	54,590 07	15,767 50	3,683 68	74,041 25
10. Colonization and Mining Roads	4,059,464 44	3,423,025 76	483,071 46	7,965,561 66
11. Aid to Railways (actual cash expended)	7,456,173 01	1,609,934 56	139,112 54	9,205,220 11
12. Good Roads, Highway Improvement and Object Lesson Roads (1912-13-14).....	114,438 05	1,384,780 27	300,198 97	1,799,417 29
Totals.....	24,195,918 30	15,045,002 19	3,044.623 04	42,285,543 53

Department of Public Works, Ontario.
Toronto, February, 1915.

J. P. EDWARDS,
Accountant, etc., Public Works.

STATEMENT No. 4.

Being a Statement of Contracts and Bonds entered into with His Majesty for the year ending 31st of October, 1914.

Date.	Work.	Subject of Contract.	Contractors.	Sureties.	Particulars.	Amount.
1913. Nov. 18....	Ontario Agricultural College, Guelph.	Installing electric freight elevator in Poultry Building.	Turnbull Elevator Manufacturing Company, of Toronto.	.....	.....	$865 00
Nov. 22....	Temiskaming District (Haileybury).	Plumbing, heating, electric wiring, etc., in new Registry Office, Haileybury.	Francis Raymond Gibson, of Haileybury.	.....	.....	1,290 00
Dec. 1.....	Game and Fisheries.	Installing new steam boiler in Steamer "Navarch."	Marsh and Henthorn, Limited, of Belleville.	.....	.....	650 00
Dec. 10....	Ontario School for the Deaf, Belleville.	Marble and tile work in Girls' Dormitory.	Hoidge Marble Company, Limited, of Toronto.	.....	.....	1,315 00
Dec. 15....	Ontario School for the Deaf, Belleville.	Installing eight lavatories in Boys' Dormitory.	Purdy, Mansell, Limited, of Toronto.	.....	.....	374 00
Dec. 23....	Temiskaming District (Haileybury).	Steel Equipment, furniture and furnishings for new Registry Office, Haileybury.	Grand & Toy, Limited, of Toronto.	.....	.....	1,697 00
Dec. 31....	Algoma District.	Supply of steel superstructure and material for the Ansomia Bridge over Thessalon River, Township of Lefroy.	The Hamilton Bridge Works Company, Limited, of Hamilton.	.....	.....	1,143 00

1914.						
Jan. 6.....	Parliament Buildings Toronto. (new wing).	Iron railing and gates in Legislative Library.	Page Wire and Fence Company, Limited, of Walkerville.	.....	.....	$1,036 35
Jan. 15.....	Ontario School for the Blind, Brantford.	Hardware, etc., for new Dormitory for Boys.	The Vokes Hardware Company, Limited, of Toronto.	.....	.....	975 00
Feb. 3	Temiskaming District (Haileybury).	Installing of the plumbing and heating system in new Court House, Haileybury.	J. E. Farrell, of North Bay.	The Canadian Surety Company, of Toronto.	.....	7,209 00
Feb. 3	Hospital for the Insane, Brockville.	Installing of the plumbing & heating in the new Reception Building.	Purdy, Mansell Limited, of Toronto.	Fred J. Lucas and Lewis R. Fox, of Toronto.	.....	21,980 00
Feb. 3	Temiskaming District (Haileybury).	Installation of the Electric wiring in new Court House. Haileybury.	The Fred Armstrong Company, Limited, of Toronto.	.....	.....	850 00
Feb. 3	Hospital for the Insane, Brockville.	Installation of Electric wiring in the new Reception Hospital Building.	Alexander G. Dobbie, (A. G. Dobbie and Company) of Brockville.	George Ross and Alexander Dillon, of Brockville.	.....	1,849 00
Feb. 3	Ontario Agricultural College, Guelph.	Installation of Electric wiring in the new Dining Hall.	The Geo. E. B. Gringer Company, Limited, of Guelph.	John J. Small and A. R. Calcott, both of Guelph.	.....	1,011 00
Feb. 5	Rainy River District (Fort Frances).	Plumbing and steam heating work in Court House at Fort Frances.	Purdy, Mansell, Limited, of Toronto.	.....	.....	10,344 00
Feb. 5.....	New Government House, Toronto.	Painting and glazing work in the Lieutenant-Governor's Residence, Chorley Park, Toronto.	John Stewart, of Toronto.	Fred J. Lucas and Lewis R. Fox, of Toronto.	.....	3,239 00

STATEMENT No. 4.—*Continued.*

Being a Statement of Contracts and Bonds entered into with His Majesty for the year ending 31st of October, 1914.

Date.	Work.	Subject of Contract.	Contractors.	Sureties.	Particulars.	Amount.
Feb. 5.....	New Government House, Toronto.	Lathing and plastering work at new Residence for Lieutenant-Governor (Chorley Park), Toronto.	Hoidge & Sons, of Toronto.	Thomas O'Neill and Henry F. Codd, both of Toronto.	.....	$5,550 00
Feb. 6.....	New Government House, Toronto.	Carpentry and joiners work at residence for Lieutenant-Governor, Chorley Park, Toronto.	George Edward Lindsay, of Toronto.	United States Fidelity and Guaranty Company, Toronto	.....	35,625 00
Feb. 12....	Ontario School for the Deaf, Belleville.	Constructing lockers in Girls' Dormitory.	Tickell & Sons Company, of Belleville .	.....	.....	395 00
Feb. 12....	Ontario Veterinary College, Toronto	Conduit and wire to eight outlets.	Bennett & Wright Company, Limited, of Toronto.	.....	.....	435 00
Feb. 17....	Rainy River District (Fort Frances).	Installation of Electric wiring in new Court House, Fort Frances.	Frank Alonzo Pearson, of Fort Frances.	Frank E. Carter and Louis Christie, both of Fort Frances.	.....	800 00
Feb. 27....	Ontario Veterinary College, Toronto.	Supply and erection complete of Electric freight elevator in College Building.	Otis-Fensom Elevator Company, Limited, of Toronto.	.....	.....	3,360 00
Mar. 3.....	Ontario Veterinary College, Toronto.	Supply and erection of fire proof stairs throughout building.	Canadian Ornamental Iron Company, Ltd., Toronto.	.....	.....	7,644 00

Mar. 16....	Ontario School for the Blind, Brantford.	Complete wiring, lamps, and lighting fixtures for new Dormitory Building.	Fred Webster, of Brantford.	.....	.....	$1,600 00
April 9.....	Ontario Veterinary College, Toronto.	The terrazzo, marble and tile floors.	The Italian Mosiac and Tile Company, of Toronto.	The Canadian Surety Company of Toronto.	.....	1,864 00
April 9.....	Ontario Agricultural College, Guelph.	Marble, terrazzo and tile work in the new Dining Hall.	Canada Hardware Limited, of Toronto.	The United States Fidelity and Guaranty Company, Toronto.	.....	4,515 00
April 18...	Ontario Veterinary College, Toronto.	Plumbing work in connection with equipment of lavatories on 1st, 2nd, 3rd and 4th floors of north wing of College.	Purdy, Mansell, Limited, of Toronto.	Fred J. Lucas and Lewis R. Fox, both of Toronto.	.....	4,765 00
April 23...	New Government House, Toronto.	Supply of wire for electric service.	Central Electric Supply Company, Limited, of Toronto.	.....	.....	1,251 36
May 1.....	New Government House, Toronto.	Supply and erection of one electric passenger elevator.	Otis-Fensom Elevator Company, Limited, of Toronto.	.....	.....	4,979 00
May 1.....	Temiskaming District	Supply of steel superstructure for the Casey-Brethour Bridge over the Blanche (White River).	The Hamilton Bridge Company, Limited, of Hamilton.	.....	.....	2,030 00
May 1.....	Muskoka District.	Supply of steel superstructure for Peninsula Canal Bridge.	The Hamilton Bridge Works Company, Limited, of Hamilton.	.....	.....	2,864 00
May 1.....	Muskoka District.	Supply of steel superstructure for Muskoka Road Bridge over Koshee Creek.	The Hamilton Bridge Works Company, Limited, of Hamilton.	.....	.....	374 00

STATEMENT No. 4.—*Continued.*

Being a Statement of Contracts and Bonds entered into with His Majesty for the year ending 31st of October, 1914.

Date.	Work.	Subject of Contract.	Contractors.	Sureties.	Particulars.	Amount.
May 8.....	New Government House, Toronto.	Tiling in bath rooms, lavatories and pantry, kitchen scullery and cold storage room in residence for Lieutenant-Governor.	The T. Eaton Company, Limited, of Toronto.	.....	.....	$10,955 00
May 16....	Hospital for the Insane, Brockville.	Installing hot water heating sytem in the Stagg Farm Building.	George Ross & Company, Brockville.	.....	.....	1,528 00
May 19....	Manitoulin District (Gore Bay).	Material and work building fence at Gore Bay Gaol.	George Strain, of Gore Bay.	.....	.....	915 00
May 19....	Ontario Veterinary College, Toronto.	Construction of cement floor in killing room.	Edward Gearing, of Toronto.	.....	.....	401 25
May 28....	Ontario School for the Deaf, Belleville.	Supply and laying of tile and terrazzo work in the Boys' Dormitory Building.	Italian Mosaic and Tile Company, of Toronto.	.....	.....	1,825 00
May 29....	Temiskaming District	Supply and erection of steel superstructure for La Blanche Bridge over River (Marter Township).	Hamilton Bridge Works Company, Limited, of Hamilton.	.....	.....	3,700 00
June 5.....	Ontario School for the Deaf, Belleville.	Construction of a hose tower and reel house.	Thomas Manley & Son, of Belleville.	A. P. Allen and J. W. Walker, both of Belleville.	.....	2,850 00

June 18....	Hospital for the Insane, Brockville.	Tiling in Reception Hospital Building at Brockville.	The T. Eaton Company, Limited, of Toronto.	.....	.....	$3,833 00
June 26....	Hospital for the Insane, Brockville.	Plumbing works, etc., in the Stagg Farm building.	George Ross & Company, Brockville.	.....	.....	811 00
July 3.....	Osgoode Hall and Normal and Model Schools, Toronto.	Supply of hard and soft coal and wood for the season 1914-1915.	P. Burns & Company, Limited, Toronto.	George D. McDonald and Edward A. Burns, both of Toronto.	Grate coal, per ton	6 87
					Small egg, per ton	7 20
					Nut "	7 20
					Soft coal "	5 25
					Hardwood, per cord	9 00
					Pine wood, per Cord	7 50
					Pine slabs, per cord	5 50
July 3.....	Government House and Parliament and Departmental Buildings, Toronto.	Supply of hard and soft coal and wood for the season 1914-15.	The Standard Fuel Company, of Toronto, Limited.	Charles T. Logan and Charles Vick, both of Toronto.	Stove size coal, ..per ton	7 40
					Small egg coal, per ton	7 40
					Nut coal, per ton.	7 40
					Pea " "	5 64
					Cannell " "	7 25
					Hardwood, per cord	8 80
					Pine slabs, per cord	6 00
July 4.....	Normal School, Stratford.	Supply of hard coal and pine slabs for season 1914-15.	C. Schneider & Company, of Stratford.	C. Dannecker and William Davison, both of Stratford.	Small egg coal, per ton	6 50
					Pine slabs, per cord	5 00
July 4.....	Normal and Model Schools, Ottawa.	Supply of hard and soft coal for season 1914-15.	The Independent Coal Company, Limited, of Ottawa.	F. K. Leveronte and Fred Slattery, both of Ottawa.	Small egg coal, per ton	7 90
					Stove coal, per ton	7 90
					Soft coal, per ton	5 50

STATEMENT No. 4.—*Continued.*

Being a Statement of Contracts and Bonds entered into with His Majesty for the year ending 31st of October, 1914.

Date.	Work.	Subject of Contract.	Contractors.	Sureties.	Particulars.	Amount.
July 4.....	Normal and Model Schools, Ottawa.	Supply of pine slabs for the season 1914-15.	John Heney & Son Limited, of Ottawa.	Edward J. Daly and John Black, both of Ottawa.	Pine slabs, per cord	$4, 50
July 4.....	Normal School, North Bay.	Supply of hard coal and pine slabs for season 1914-15.	Lindsay & McCluskey, of North Bay.	B. S. Leak and Jas. A. Smith, both of North Bay.	Small egg coal, per ton	7 75
					Nut coal, per ton.	8 00
					Pine slabs, per cord	4 50
July 4.....	Normal School, London.	Supply of hard coal and pine slabs for season 1914-15.	Chantler Brothers, of London.	H. K. McCormick and James Johnson, both of London.	Small egg coal per ton	6 70
					Pine slabs, per cord	6 50
July 4.....	Normal School, Hamilton.	Supply of hard coal and pine slabs for season 1914-15.	Thomas Myles' Sons, Limited, of Hamilton.	W. H. Myles and Geo. H. Precious, both of Hamilton.	Small egg coal, per ton	5 92
					Nut coal, per ton.	6 12
					Slabs, per cord ..	6 25
July 4.....	Ontario School for the Blind, Brantford.	Supply of hard and soft coal for season 1914-15.	Daniel McDonald, of Brantford.	Stephen P. Pitcher and John Fair, both of Brantford.	Stove coal, per ton	6 20
					Nut coal, per ton.	6 30
					Soft coal, per ton	4 35
July 8.....	Parliament Building, Toronto (Treasury Department).	Supply and filling up of counters, etc., in Treasury Department.	George E. Lindsay, of Toronto.	.....	.....	1,962 00

July 8.....	Ontario School for the Deaf, Belleville.	Supply of hard and soft coal for the season 1914-15.	The Downey Coal Company, of Belleville.	J. E. Walmsley and Charles N. Sulman, both of Belleville.	Slack (by rail), per ton ..... Slack (by boat), per ton ..... Small egg, per ton ..... Nut, per ton .... Stove, per ton .. Hard coal screenings	$3 78 3 45 6 75 6 95 6 75 1 50
July 22....	Ontario Agricultural College, Guelph.	Alterations to the chemical laboratory.	W. E. Taylor, of Guelph.	.....	.....	945 00
July 24....	Hospital for the Insane, Brockville.	Installation of one electric passenger elevator in Reception Hospital, Brockville	The Turnbull Elevator Manufacturing Company.	.....	.....	3,235 00
July 27....	Ontario Veterinary College, Toronto.	Supply of hardware, fittings, etc.	The Vokes Hardware Company, Limited, of Toronto.	.....	.....	1,270 00
July 27....	Ontario Veterinary College, Toronto.	Supply and setting up of interior fittings, desks, tables, cupboards, blackboards, platforms, etc., in building.	The Berlin Interior Hardwood Company, Limited, of Berlin.	.....	.....	4,275 00
July 27....	Rainy River District (Fort Frances).	Construction of an addition to the gaol at Fort Frances, including installation of electric wiring and heating.	East and Corrin of the Town of Fort Frances.	.....	.....	2,287 00
July 29....	New Government House, Toronto.	Bronze and ornamental iron work and steel structural work of ceiling lights, etc.	The Canadian Ornamental Iron Company, Limited, of Toronto.	Eliza Lea and Bertha Lea, both of Toronto.	.....	11,200 00

STATEMENT No. 4.—*Continued.*

Being a Statement of Contracts and Bonds entered into with His Majesty for the year ending 31st of October, 1914.

Date.	Work.	Subject of Contract.	Contractors.	Sureties.	Particulars.	Amount.
July 29....	New Government House, Toronto.	Metal furring, lathing and plastering work, etc., in new residence, Chorley Park.	W. G. Hynes, Limited of Toronto.	The United States Fidelity and Guaranty Company, of Baltimore, U.S.	.....	$17,000 00
July 29....	New Government House, Toronto.	Painting and glazing work, etc., in new residence at Chorley Park.	John Stewart, of Toronto.	H. Meldrum and George Stewart, both of Toronto.	.....	6,363 00
July 29....	New Government House, Toronto.	Marble mosaic floors and terrazzo flooring in new residence for Lieutenant-Governor of Ontario.	The Italian Mosaic and Marble Company, of Toronto.	The United States Fidelity and Guaranty Company, of Baltimore, U.S.	.....	2,505 00
July 30....	Ontario School for the Deaf, Belleville.	Cement sidewalks around boys' dormitory.	Thomas Manley & Son, of Belleville.	.....	Sidewalk, per sq. foot. ..... Filling, per lineal foot	0 14 0 05
July 30....	Ontario Agricultural College, Guelph.	Kitchen equipment and fittings in new Dining Hall.	Stevenson & Malcolm, Limited, of Guelph.	.....	.....	1,485 60
July 31....	Hospital for Epileptics, Woodstock.	Excavating work and building concrete wall of basement of new Recreation Hall.	C. E. Rapson, of Woodstock.	.....	.....	1,985 00
Aug. 5.....	New Government House, Toronto.	Carpentry and joiners' work in the main building (excepting the bedrooms on second and third floors) of new Residence, Chorley Park.	W. J. Trick Company, of Oshawa.	Samuel B. Trick and Henry T. Jackson, both of Oshawa.	.....	38,475 00

Aug. 17....	Ontario Agricultural College, Guelph.	Equipment, etc., for the new Dining Hall.	The Brantford Oven & Rack Company, Limited, of Brantford.	.....	.....	$408 00
Aug. 18....	Ontario Agricultural College, Guelph.	Electric light fixtures for new Dining Hall.	R. A. L. Gray & Company, Toronto.	.....	.....	1,276 00
Aug. 18....	Ontario Government House, Toronto.	Marble works, monolithic Columns, terra cotta furring, etc., at Lieutenant-Governor's Residence, Chorley Park.	The Hoidge Marble Company, Limited, of Toronto.	J. R. Hoidge and R. J. Hoidge, both of Toronto.	$17,853.00 Extra Mantel 350.00 do 650.00	18,853 00
Aug. 20....	Ontario Veterinary College, Toronto.	Galleries, platform seats, horse racks, etc.	Thomas Gearing, Toronto.	.....	.....	2,967 00
Aug. 28....	Temiskaming District (Haileybury).	Furniture and fittings for the new Court House at Haileybury.	Berlin Interior Hardwood Company, of Berlin.	.....	.....	2,620 00
Aug. 28....	Rainy River District (Fort Frances).	Furniture and fittings required in the new Court House, Fort Frances.	The Canadian Office & School Furniture Company, Limited, of Preston.	.....	.....	3,090 00
Sept. 2.....	Rainy River District (Fort Frances).	Electric fittings, etc., for the new Court House, Fort Frances.	The Pearson Electric Company, Fort Frances.	.....	.....	750 00
Sept. 2.....	Ontario Veterinary College, Toronto.	Supply and Installation of electric fixtures, etc.	The T. Eaton Company, Limited, of Toronto.	.....	.....	1,740 20
Sept. 10....	Hospital for the Feeble Minded, Orillia.	Slate roofing for the dormitory.	Douglas Brothers, Ltd., Toronto.	.....	.....	1,609 00

STATEMENT No. 4.—*Continued.*

Being a Statement of Contracts and Bonds entered into with His Majesty for the year ending 31st of October, 1914.

Date.	Work.	Subject of Contract.	Contractors.	Sureties.	Particulars.	Amount.
Sept. 11....	Normal School, Peterborough.	Supply of hard coal and pine slabs for season 1914-15.	H. B. Taylor, and Son, of Peterborough.	William Noftall and William Butler both of Peterboro.	Large egg coal, per ton ..... Pine slabs, per cord	$7 15 3 25
Sept. 11....	Hospital for the Insane, Brockville.	Installation of two electric worm gear dumb waiters in Reception Building at Brockville.	Roelofson Elevator Works, of Galt.	.....	.....	1,485 00
Sept. 16....	Temiskaming District (Haileybury).	Electric light fixtures and fittings in the new Court House, Haileybury.	Fred Armstrong Company, Limited, of Toronto.	.....	.....	623 00
Sept. 22....	New Government House, Toronto.	Interior hardware, etc., for the Lieutenant-Governor's Residence.	The T. Eaton Company, Limited, of Toronto.	.....	.....	7,745 00
Oct. 7.....	Goulais River Bridge, (Algoma District).	Supply and erection of the steel superstructure of a bridge over Goulais River, Vankoughnet Township, Algoma District.	The Hamilton Bridge Works Company, Limited, of Hamilton.	.....	.....	3,375 00
Oct. 7.....	Gough's Bridge (Parry Sound District).	Supply and erection of the Steel superstructure of Gough's Bridge over South River, Himsworth Township.	The Hamilton Bridge Works Company, Limited, of Hamilton.	.....	.....	994 00

Oct. 7.....	Rates Bridge, (Algoma District).	Supply and erection of the steel superstructure of a bridge over Thessalon River, Aberdeen Township.	The Hamilton Bridge Works Company, Limited, of Hamilton.	.....	.....	$864 00
Oct. 7.....	Game and Fisheries, (Rondeau Park).	Supply and construction of wire enclosures for game at Rondeau Park.	The Page Wire Fence Company, Limited, of Walkerville.	.....	.....	1,700 00

Department of Public Works, Ontario.
Toronto, February, 1915.

J. P. EDWARDS,
Accountant, etc., Public Works.

GR. YELLOW-LEGS
(*Totanus melanoleucus*)

Eighth Annual Report

OF THE

GAME AND FISHERIES DEPARTMENT

1914

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO:
Printed and Published by L. K. CAMERON, Printer to the King's Most Excellent Majesty
1915

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29-37 Richmond Street West
TORONTO

To His Honour JOHN STRATHEARN HENDRIE, C.V.O., Lieutenant-Colonel in the Militia of Canada, etc., etc., etc.

Lieutenant-Governor of the Province of Ontario.

MAY IT PLEASE YOUR HONOUR:

I have the honour to submit herewith, for the information of Your Honour and the Legislative Assembly, the Eighth Annual Report of the Department of Game and Fisheries of this Province.

I have the honour to be,

Your Honour's most obedient servant,

F. G. MACDIARMID,
Minister of Public Works.

TORONTO, 29th March, 1915.

Eighth Annual Report

OF THE

Department of Game and Fisheries of Ontario

To the Honourable F. G. MACDIARMID,

Minister of Public Works.

SIR,—I have the honour to submit for your consideration the report of the Department of Game and Fisheries for the fiscal year ending October 31st, 1914.

LAWS AND REGULATIONS.

The amendments to the Ontario Game and Fisheries Act enacted during the session of 1914 contained two important provisions; one limited the season's bag for ducks, and the other provided for the licensing of fur dealers. According to the reports of overseers, the bag limit has proved so liberal that few have been tempted to exceed it, and the fortunate few have been sufficiently public spirited to pay regard to it.

The licensing of fur-dealers was a step towards increasing the control exercised over the wild fur-bearing animals of the Province, with the object of preserving them from extinction. Unless a step further is taken and the trappers also compelled to take out licenses, it will not be possible for the Department to render to the Province the service that is expected from it. When the licensing of the fur dealers was proposed, it was contemplated that trappers also should be included, but objections were raised on the ground that it would inflict a hardship on farmers and farmers' sons, particularly in the districts where the returns from the cultivation of the soil were so poor that they had to be supplemented, and consequently the new provision was restricted to the dealers.

That their inclusion would have been appreciated by the trappers has been clearly demonstrated to the Department since the Act was amended. Several of them have applied for licenses, and many more have urged the desirability in the interests of the Province, of the animals, and of the trappers themselves, that trapping should be more thoroughly regulated than it is at present. From non-resident trappers, some of whom are reported to take away each season from the north-western parts of the Province furs amounting in value to between one thousand five hundred and two thousand dollars, a very substantial increase of the present fee of $50.00 might be demanded, but for resident trappers the $5.00 suggested by Superintendent Tinsley some years ago should be ample. Such a valuable natural resource as the wild fur-bearing animals should, however, be made to contribute a larger return to the Public Treasury than could be obtained from license fees alone, and I beg leave to suggest that this be collected in the form of a royalty on the more valuable skins. The imposition of a royalty, besides affording revenue, should enable the Department to restrict the catch within such limits as experience might show to be safe.

It will be remarked that several overseers recommend that every one who wishes to carry a gun, except a farmer on his own farm and immediate vicinity, should be compelled to take out a license. One of the strongest reasons advanced is that it would prove a salutary check on the reckless destruction of insectivorous and song birds, which a certain element of our population appears to consider legitimate sport. A number of other reasons are urged, and much as existing regulations, which merely require a citizen of the Province to observe a certain close season, and imposing a small fee for the taking of big game, may appear ideal in a liberty loving community like Ontario, there is no doubt that the restrictions incidental to a gun license would be welcome to all sportsmen. Even from the sparsely peopled parts of the Province, requests have come for a re-enactment of the provisions which require settlers to take out permits, the law abiding citizens preferring to be under restraint rather than see the indiscriminate slaughter which is undoubtedly perpetrated in certain remote sections.

While the trapper's and gun licenses and a royalty on the furs taken in the Province could not be seriously objected to, the same can hardly be said of the suggestions repeatedly made that residents should not be allowed to angle except under the authority of a permit. May the time when such a proposition shall be seriously entertained be far removed.

Fisheries.

The serious warning contained in Superintendent Tinsley's report of last year addressed to certain fishermen who were inclined to ignore the domestic market appears to have had a good effect. While local dealers have occasionally drawn attention to the prices they were asked to pay, investigations have demonstrated that the home demand, even at lower figures than were offered by United States buyers, received first consideration. Companies looked upon as organized solely to cater to the export trade have conclusively shown that the requirements of the home market had been liberally provided for, so much so in some cases that some of their local customers were actually exporting what they were supposed to have bought for domestic consumption.

While the productiveness of Lake Erie and of the eastern end of Lake Ontario is fairly well maintained and has demonstrated the value of hatcheries, the condition of Georgian Bay continues to give the Department much anxiety. There is no body of water that would repay attention better than this, and two or three additional whitefish hatcheries should be located at certain advantageous points. Among the many reasons why Georgian Bay should receive early attention not the least is the desirability of building up on its shores a large and prosperous fishing community. Very little of the territory surrounding the Bay is of a kind suitable for agriculture, and while a certain amount of lumbering is carried on, this industry is not likely to afford increasing employment, so that it is of great importance that encouragement should be given the fisheries as providing a healthful and remunerative occupation. All indications point to a maintenance of the good prices that have ruled for some years, and what such conditions mean those familiar with the prosperous fishing communities along Lake Erie know well.

While Georgian Bay is undoubtedly the body of water in this Province in most need of re-stocking, Lake Erie should also receive attention. Fortunately, the states forming the southern shore of that lake have taken up fish propagation on an extensive scale, and it is due to this that the unrestricted fishing on the United States side of the boundary has been possible without resulting in deple-

tion; but, aside from the heavy fishing carried on south of the International Boundary, the abolition of the close season by the Dominion authorities demands that scientific means be adopted on a commensurate scale to replace the laborious, wasteful, and altogether inadequate processes of unassisted nature, and a hatchery in the eastern bight and one in the vicinity of Port Stanley are urgently needed.

Nothing affords a better illustration of the value of artificial propagation than the work carried on at the Provincial Hatchery at Mount Pleasant near Brantford. Results of past work are visible in various parts of the Province. Last year the Superintendent was rewarded for his devotedness to his work and had the satisfaction of turning out about half a million bass fry and fingerlings, which were planted in various waters in the Province. To this work was assigned Mr. Henry Watson, as special officer in charge of distribution, who accompanied Mr. J. T. Edwards, Superintendent of the hatchery, on every planting trip made by the Government fish car. Mr. Watson is well known as a keen and experienced angler and thoroughly familiar with most of the waters of the Province, so that followers of the gentle art may confidently look forward to an improvement in many of the waters about which complaints have been often heard of late years.

During the year, the scope of the hatchery has been increased by the erection of a trout hatchery and ponds, under the supervision of Mr. A. J. Halford, Chief Provincial Engineer. When the addition is completed, it is expected that about three million trout and one million bass fry will be turned out every year from Mount Pleasant. As a start with brook trout, a number of eyed eggs have been ordered for the coming season, and these, with the brown trout fry to be raised from the eyed eggs so very generously promised to the Department by the Honourable N. R. Buller, Commissioner of Fisheries for the State of Pennsylvania, will give approximately one million fry for distribution in the spring of 1915.

In view, however, of the suitability of the waters of this Province for fish life, and the increasing popularity of our lake and riverside resorts, it is only too evident that further provision will have to be made at an early date for a game fish hatchery on an adequate scale at some suitable point on the Trent Valley waters. Such a hatchery should turn out sufficient maskinonge, trout and bass to re-stock the waters of Old Ontario that have been overfished, besides supplying fry for stocking suitable waters in the newer parts of the Province.

The unsatisfactory nature of the regulations governing the Lake Erie fisheries has again been proved. Numerous complaints have been made during the year that several of the gill net fishermen paid no regard whatever to the conditions of their licenses defining the territory in which they were allowed to operate. Upon a careful review of the situation, I feel obliged to urge strongly that the recommendation made by Inspector Holden some years ago in favour of the opening of the lake beyond a certain distance from the shore to all licensed tugs irrespective of home port be reconsidered. There is a large body of water lying between the Port Stanley meridian and Pelee Island, within which only six Canadian tugs are allowed to operate, and from this area large quantities of fish are taken by United States vessels. It does not appear reasonable that our own boats should be debarred from operating in these waters and be tied down to fish only opposite certain townships or certain ridings.

Game.

While the protective measures enacted have resulted in the preservation of our big game and a marked increase in certain localities, there are certain sections of the Province, notably in the districts of Kenora, Rainy River, Fort William

and Port Arthur, where the brush wolf is becoming a serious menace. The destruction reported would indicate that steps should be taken to exterminate this foe. In the localities infested by it, the opinion is that a bounty of $5.00 would be enough, owing to the animals being found in sufficient numbers to make it worth while making a business of hunting them. It is further claimed that such a bounty would revive interest in the grey timber wolf, the bounty upon which does not afford adequate remuneration for the trouble involved in hunting that species alone.

Nothing is more encouraging than the reports received as to the sport afforded by our various kinds of game. While a good deal of illegal hunting is practised in certain localities, the steadily increasing interest being taken all over the country in the protection of game is evidenced by the number of communications received whenever any serious law-breaking takes place in any community. Such complaints are of the greatest value to the Department, and prompt attention is always given to them.

Among the game that has responded to protection, pheasants deserve particular mention. These fine birds are reported abundant at certain points of the Niagara Peninsula, and there is every prospect that they will be in sufficient numbers to afford good sport during a limited season for years to come, provided the bag is properly limited.

During the year the Department imported one hundred brace of Hungarian Partridge, which were distributed through the Counties of Essex and Kent. From reports received to date, the experiment promises well.

The advisability of having a uniform season for all small game except waterfowl has been urged upon the Department, and very strong arguments are used in favour of a season for one month from October 15th to November 15th. There exists a difference of opinion as to the proper remedies in the case of game which has become scarce; one proposed is to further shorten the open season for the same within the open month for game in general and the other to have periodical close seasons for such game.

With regard to ducks, a number of complaints are made that in some districts the season opens after certain species have gone, and in others that the season ends a fortnight earlier than in adjacent jurisdictions. The line dividing the Province into northern and southern districts is also attacked, and the Canada Atlantic Railway line has been suggested as an improvement. The districts likely to be affected will probably urge the selection of a more southerly line, which would seem to meet all requirements.

Rondeau Provincial Park.

The report of this Department includes for the first time the report of the Superintendent of Rondeau Provincial Park, this domain having been transferred to this Department from the Department of Lands, Forests and Mines. The report of Superintendent Goldworthy gives but a faint idea of the excellent work that has been done during the year, and which has been commented upon in the most flattering terms by those who have had occasion to visit the park.

Acknowledgments.

The Department is under obligation to the railway companies for the free haulage of the Government fish car during planting operations, and to the officers of the railway companies for the courtesies extended, and aid rendered in facilitating the movements of the car between different points.

Valuable assistance has also been rendered the Department by a number of the officers of the Provincial Police. Owing to its limited resources, the Department is not in a position to maintain as large a number of overseers as a full protection of fish and game would demand. The effect of this, however, has been minimized very largely in the northern parts of the Province by the active co-operation of the Superintendent of Provincial Police and his staff.

The greater debt, however, is due to those officers of the Department whose interest in the preservation of the fish and game of their home Province has been so strong as to make them overlook the insignificance of the pay attached to their office, and who have year in and year out, in all conditions of weather, and in all sorts of ways, rendered services, the value of which it is impossible to estimate.

I have the honour to be, Sir,

Your obedient servant,

A. SHERIFF,

Deputy Minister of Game and Fisheries.

March 29th, 1915.

A. Sheriff, Esq.,
Deputy Minister of Game and Fisheries.

Sir,—I have much pleasure in congratulating you on your appointment to the important position of Deputy Minister of Game and Fisheries. The records will show the administration of this growing Department and the business transacted up to May 7th, when you took charge. I realize the increasing importance of the Department which necessitated your appointment, and I feel sure it will progress under your able administration.

With the large addition to the Province, making the area 407,252 square miles of land and water, with 600 miles of sea coast, the effective protection and preservation of the game, fish and fur-bearing animals in this immense territory will necessitate a large increase in the number of protectors at present in the service. This will mean increased expenditure which will have to be provided for. The most feasible way to do this is to impose resident licenses for killing small game, and also trappers' licenses for killing fur-bearing animals. This is urgent and should be done without delay, as it may be advisable, owing to the large increase of beaver in the Province, to have a short open season for them. The Government is certainly entitled to some return for the expenses incurred in protecting these interesting animals for the last twenty years, before which time they were nearly exterminated.

It may be advisable for some years to come, and in the interest of all concerned, for the Government to allow the two large fur companies, either by lease or bounty on equitable terms, to continue their important business in their respective districts, of procuring furs for the markets of Europe. This would have the beneficial effect of enabling these companies to furnish employment and sustenance, as in the past, to Indians and others in those sparsely separated districts.

I trust that the Indians and residents of that portion of the Province referred to in the Order-in-Council, approved by His Honour the Lieutenant-Governor, the ninth day of October, A.D. 1914, will show they appreciate the kindness of the Government in temporarily extending the open seasons, and that none of them will be guilty of ingratitude and bad taste by preferring partridges to hares. It is not necessary to refer further to this matter, except to say that I hope good, honest, common sense will prevail and prove beyond doubt that the Government were justified in trusting these people.

When the barbarous contention that might is right is effectually disposed of for at least another hundred years, though at such a terrible cost, and peace and good will to man again prevail, it is reasonable to expect that for many years to come our wealthy American neighbours will not seek health and recreation in the blood-stained and devastated countries of Europe, but will wisely decide to seek the rest and recreation they require in the beautiful northern woods and lake districts of Ontario, unexcelled elsewhere for that purpose. It should be the imperative duty of all concerned, viz., railroad and steamboat companies, hotel and store-keepers, guides and others, to show all possible courtesy to our visitors. Extortion or incivility by licensed guides should be reported to this Department.

Our late respected Minister, Dr. J. C. O. Reaume, having retired from the Government, I desire to thank him for his uniform courtesy, and for his fairness and impartial treatment of all connected with the business of this Department.

All of which is respectfully submitted by your obedient servant,

E. Tinsley.

November 23rd, 1914.

Toronto, November, 1914.

A. Sheriff, Esq.,
Deputy Minister of Game and Fisheries.

Sir,—I have the honour to submit my report for the season of 1914.

The commercial fishermen have not had as successful a season as usual. They report that during the spring months and early summer the fishing was better than for several years, but that later, and especially during October, the catch was very poor. The very stormy weather during October and the late spawning of the lake trout will account for most of the shortage.

Although it hardly comes within my province, I wish to call your attention to a situation that must be very unsatisfactory to the parties interested, and which appears to be more difficult each year. This is the spawn gathering for the different hatcheries operating in the Province. I refer more particularly to lake trout. Apparently our seasons have changed, the cold weather coming on later, and as the spawning season is regulated by the temperature of the water, it has been very difficult to secure enough spawn before the 1st of November, when the fishing season closes. There are two or three ways by which this condition may be improved: 1st, lengthen the open season; 2nd, abolish the close season altogether; 3rd, the authorities in charge of the hatcheries might operate nets for the special purpose of procuring spawn. The latter, I am afraid, would be a cumbersome, expensive, and not very satisfactory method of doing the work, as it would necessitate the establishment of fishing outfits at several points, and these could only be used for a few weeks each year.

Two new hatcheries were built during the year and are operating this winter for the first time, one at Belleville, the other on the Lake of the Woods. With a few more of them it might be possible to abolish the close season without injury to the fisheries.

In connection with this I would recommend that it be made a condition on all licenses that the licensee must help in all ways possible any person employed by the authorities in charge of the hatcheries in gathering spawn of any kind. I have heard of a few cases where fishermen have asked to be paid for allowing spawn to be taken from fish caught by them. While I do not think we have many men who depend on fishing who are as short-sighted as this, it should be made impossible for anyone to do so.

Another matter that is deserving the attention of the Department are the Georgian Bay fisheries. It has been known for some time that these waters were being over-fished and that not enough re-stocking was being done. So fully has this been realized that I believe that your Department has for some time refused to grant any new licenses. This, no doubt, is the proper thing to do, but I am afraid that it will take many years to replenish the bay unless something more is done. As you know, this bay is the one part of our great lakes system over which the Dominion and Province have complete control, and whatever is done for the benefit of Georgian Bay is done for our own people. And here I might say that the country surrounding this bay, or a great part of it, is not suitable for farming, and consequently a great many of the settlers depend largely on fishing and trapping for a living, and they will depend on these more and more as the lumbering industry moves further back. These being the conditions, I am loath to recommend the cutting off of any fishing privileges now enjoyed by the fishermen, as depriving them of their present occupation simply means that they would have to leave that part of the country.

We all know that the Georgian Bay was some years ago a great producer of white fish, and I do not know of any change in conditions that would prevent as great a production at the present time if it was sufficiently stocked with white fish fry.

Two hatcheries, propagating both white fish and pickerel, in addition to those now operating, would I believe in a few years place these waters in somewhere near the same class they formerly held. If something of this kind is not done it will be necessary to reduce the amount of fishing by 25 and possibly 50 per cent., and this will be a hardship to a great many people.

ANGLING.—From nearly all parts of the Province reports come that the number of tourists visiting the fishing grounds shows a considerable falling off compared with former years, caused largely, no doubt, by the general depression, certainly not due to any shortage of game fish, as all reports say that from an angler's standpoint fishing has not been better for years. I am taking it for granted that the work being carried on at your Mount Pleasant bass ponds is showing results.

I wish to congratulate you and your Superintendent of Bass Ponds on the splendid results of the last season's operations. The output was at least double that of any previous year.

With the addition of another pond, the installation of a speckled trout hatchery and the experience gained, you will be in a position to fill nearly all requests for re-stocking the public waters of the Province with game fish.

It would be in the interest of all concerned if a size limit was put on perch, blue pickerel, and white bass that commercial fishermen may take.

Just to remind you that we are still without a resident trapper's license.

Your obedient servant,

WM. W. HOLDEN,

Inspector.

A. SHERIFF, ESQ.,

Deputy Minister of Game and Fisheries.

SIR,—I have the honour to submit my annual report.

During the year I have again visited the greater portion of the Province and found the Fish and Game Laws were being well observed. Fewer violations took place in the past year than ever before, proving that your officers are performing their duties.

Although angling was better than previous years, fewer tourists visited our waters. This was due, no doubt, to the war.

Commercial fishing is reported as good as in former years.

I wish to call your attention to the condition of the fisheries in the north end of the Georgian Bay. I was in this part of the Bay for over two weeks during the past season and from what I saw and heard certainly consider that these waters are being over fished, and would recommend that some way be found to curtail it. If something of this kind is not done I am afraid it will become necessary to establish a closed area in which no net fishing will be allowed for a number of years.

Deer, moose and partridge are reported as more plentiful than in years past. Beaver are also becoming more plentiful, so much so that they are doing damage to the farms.

The wolf question is still a serious one, there is no doubt but that they are increasing in numbers and have done a large amount of damage to settlers by killing their stock. In Renfrew County alone, during 1914, over 200 sheep have been killed, besides young cattle and colts. I would like to see the bounty raised to $25 or $30, which would perhaps be an inducement to hunters to catch them.

Muskrats are reported to be on the increase. I would recommend that the open season should begin on January 1st each year, and that all trappers should be licensed.

I would suggest that the hare and partridge seasons should open at the same time.

The patrol service this year has been most satisfactory and has had a deterrent effect on lawbreakers. The few violations of the Act show that people are being educated to the fact that the laws must be observed.

Your obedient servant,

ALF. HUNTER,
Inspector.

RONDEAU PROVINCIAL PARK.

A. SHERIFF, ESQ.,
Deputy Minister of Game and Fisheries.

SIR,—I have the honour to submit my first annual report beginning December 1st, 1913.

A public driveway, 137 rods in length, running across the park from the restaurant on the bay front to Lake Erie, was completed. It was made with a clay foundation, covered with clean gravel and is extensively used by autos and other vehicles. This road connects with the Pine Ridge road running along the Lake Shore. This driveway through the pines has been widened and the roadbed repaired to some extent for a distance of three miles or to the first fishery on the Park. All told we now have ten miles of roadway on the Park and a great deal of it is kept in good condition by the use of the split log drag. Where the two roads connect at the lakeside four acres of bush were underbrushed and grubbed out for a picnic ground.

From the disposal of the down timber taken for saw logs, barn timber, fish box stuff, and firewood, $1,500 was realized.

A good comfortable house has been completed for the assistant ranger.

The restaurant was moved to a more suitable location, making it more convenient to the picnic grounds and the new roadway.

A new aviary has been erected which covers an area of half an acre, and is enclosed by a substantial iron and woven wire fence six feet high, on a foundation of cement which is 2½ feet in depth. There are 14 pens 11 by 38 feet each and are divided by similar fencing and foundation, all covered with No. 12 one inch diamond mesh wire in iron frames. This includes a shed for the

roosts 160 feet by 8 feet, and 8 feet high. Then there is a large yard for rearing the young birds. We now have in the aviary, Lady Amherst, Golden, Reeves, Silver and English R. N. pheasants, also some Hungarian partridge.

Our flock of 17 wild turkeys running at large on the park are in fine condition. It was found necessary to dig and scrape out a larger and deeper pond for the wild geese, of which there are twenty in the park enclosure.

The beaver procured from Algonquin Park last spring have been working on the marsh and in the edge of the bush. They have a good house and appear to be making themselves quite at home.

Black squirrels are very numerous.

The deer are increasing in number so rapidly that it will be necessary to dispose of a good number each year to keep them from overrunning the country adjoining the park and also from destroying the young growth.

There are 30 cottages at present, the owners of which respond to the regulations very satisfactorily.

The visitors to the park this year were constant, there being a half more than any other year in the history of the park. It is quite common for people to auto 40 and 50 miles to spend the day. Tourists who come are delighted with the trip through the park forest. The deer, black squirrel, etc., as well as the tall straight forest trees seen on this trip make it interesting. There is a great need for a suitable boarding house as there is no such accommodation on the park, consequently a great number who desire to come are unable for that reason.

There was always a large crowd coming and going on Sundays during the summer. Sunday school was held in the pavilion in the morning, and religious services conducted by a student for an hour in the afternoon, which were regularly attended by the campers and others and their children.

GEORGE GOLDWORTHY,
Superintendent Rondeau Park.

Overseer J. R. Bradbury, of Blind River, reports that the catch of fish was quite as good as in 1913. There was a falling off in some localities, but taking the district throughout, the catch was about the same. Whitefish fell off somewhat, but other varieties, such as pickerel, trout, mullets, pike and sturgeon, were as plentiful as ever. Very few perch were caught except in the western part of his district. The pickerel catch, which is most important, was very good and the fish of good size. Trolling and angling were better than usual in some of the small lakes and streams, and some splendid specimens of bass were taken. In some small lakes pike seem to be killing the other varieties; dogfish are also doing considerable damage.

Red deer seem to be fairly numerous, though the wolves are doing a great deal of damage. Carcasses of deer may be seen partly devoured or with nothing left but the bones. If wolves continue to increase as fast during the next year or two, deer will be driven out entirely. He strongly advises that the bounty for wolves be increased to $20 each.

Moose are quite numerous in some localities, and splendid specimens are seen from time to time. Wolves do not seem to trouble moose, as he has not known of any case in the district where they have killed them.

He would advise that the open season for red deer, moose and caribou be changed to read from November 10th to December 10th, for the meat would keep better and there would be less wasted.

Ducks are not numerous and partridge are scarce. Mink and muskrats show little change, not many being trapped on account of lower prices. Beaver are increasing.

Overseer P. W. Kent, of Kentvale, reports that there are less fish than last year in the small streams. Trout fishing is nearly a thing of the past. This he thinks is due to the fact that there are a great number of cranes nesting near the streams and they catch the fish. In the lake the fishermen say that the fishing is about the same as last year.

There were not many tourist visitors on account of the war, only about one-third of the cottages along the shores being occupied, and those who did come did not come to angle.

Game is increasing on the island slowly. Last year moose and deer were not so plentiful as this. Ducks and partridge are about the same. Beaver are very plentiful, also bears. Muskrats seem to be increasing.

Overseer Henry Johnson, of Brantford, reports that angling in his district was not very good during the early part of last season, but later bass and pickerel fishing was good and trout were about the same as the previous year. Coarse fishing was good.

Black and grey squirrels, also rabbits are on the increase. Duck and woodcock are about the same as last year.

Muskrat and mink are more plentiful, and there seem to be more coon than usual.

The overseer gratefully acknowledges his indebtedness to the Deputy Game Warden and the public for the assistance they have given him this year in his efforts to have the laws observed in his territory.

Overseer J. W. Morton, of St. Ola, reports that bass and trout fishing in the lakes in his division during the summer was fairly good. He sold more angling permits than in 1913.

Partridge and ducks are quite plentiful, also deer.

Squirrels, rabbits, beaver, bear and wolves are numerous.

He would recommend that fishing through the ice be prohibited in his district as it has a tendency to lessen the quantity of salmon trout.

Overseer Arthur Corsant, of Masonville, reports that angling was very fair for a part of the season, but on August 12th there was a slaughter of fish for many miles west of the City of London. He does not think there was one fish left alive in the river for twelve miles west of London. The water seemed to be polluted with some strong drug or acid, for it turned a black colour. The trouble might arise from a number of sources, one of which is the sewer from the city which empties into the river.

Game is very scarce in this district. Black squirrels are slightly on the increase, but mink and muskrats are very scarce. He is of the opinion that squirrels, quail and partridge should have a close season for three years, which would greatly increase the number.

Overseer J. M. Temple, of Dorchester, reports that game fish are scarce in his district, as none come up the river. All there are, are bred in the river east of London on account of the fish slides not being in proper order. All other fish are scarce.

Game is quite scarce. There are a few ruffed grouse or native partridge. Quail is almost a bird of the past and ducks are very scarce. There are very few woodcock. Wood hares are plentiful, but there are no black squirrels. There are a few muskrats, while mink are very scarce. There are no beaver or otter.

The Overseer recommends that every person who wishes to carry a gun be obliged to take out a license.

Overseer W. H. S. Gordon, of Port Arthur, reports a dropping off in the fishing in his district; the catches in portions of Lake Superior have been particularly light during the summer. In the fall, however, fishing picked up again and many of the men succeeded in bringing their catch up to the mark of the previous years. This was more particularly noticed in the Thunder Bay District. At Rossport the catch was lighter, which was largely accounted for by the weather.

Herring fishing out of Port Arthur last fall was particularly good. There were practically no facilities for the fishermen to handle these fish, as a large amount of space is required for salting. He was, however, instrumental in securing, for a very small amount, the use of a dock and shed from the Canadian Northern Railway, which made it possible for the fishermen to get their fish to the market. Last fall a number of fishermen brought their outfits from Rossport, and with the accommodation that he was able to procure for them, they were able to fish for herring out of Port Arthur. It was the most successful season for herring ever experienced on Thunder Bay. During the early stages there was practically no market for the fish, and almost all had to be salted. However, latterly orders have been received from all parts of the east and the fish were frozen and shipped out in car loads.

The fishermen have shown an excellent spirit of liberality during these hard times. The Dominion Fish Co. and Messrs. Nicol, Bowman and Craigie have all contributed largely to relief, over 400 bags of the fish being handed over to the city authorities for distribution.

During the season he visited the eastern part of the district twice, going as far as Jackfish. He also went up the line of the Duluth Extension Railway on two occasions, going as far as Arrow Lake. A large number of communications had been received from farmers in that section requesting permission to fish in lakes for their own use. Whitefish Lake is one of the finest breeding grounds for fish in the district, and this spring Mr. McNabb, representing the Dominion Government, spent some time there procuring spawn for the Port Arthur hatchery, and was very successful. In the other inland lakes under his jurisdiction the reports show that the fishing was up to the average.

There have been no saw mills in operation along the water front or on rivers adjacent to Thunder Bay, there was therefore no need for scrutiny regarding the dumping of the sawdust.

He would recommend that more inland lakes be opened for commercial fishing. There are hundreds of these lakes adjacent to Port Arthur and Fort William, and almost all are in the vicinity of railways. If these were leased to fishermen, and were fished in the same manner as Whitefish and Arrow Lake, which come particularly under his attention, it would mean a great deal to the district. There is a large market for the fish in the eastern and western portions

of Canada, in fact practically all the fish that are caught in these waters now go to Canadian markets. The opening of the lakes would give employment to a large number of men and there is no doubt but that the lakes would be greatly benefited. In none of the lakes in the district where careful fishing has been carried on has there been a diminishing of the supply, and in some of the lakes the fishing is better to-day than ever before. In the lakes that are not being fished the fish are very coarse, and it would require at least three seasons to thin out these. In many sections reports were made last fall that hundreds of fish were seen lying on the banks, showing that these lakes should be fished.

Overseer John Jones, of Fenelon Falls, reports that the coarse fish such as suckers, carp, bullheads, ling and perch should be taken out of Lakes Sturgeon, Balsam and Cameron, carp in particular, which are coming in quickly by the lift lock from Lake Simcoe

He is of the opinion that the close season for trout should be from October 1st to November 1st, as they are generally spawning from October 10th to November 10th.

Fishing was very good this season.

He would suggest that the bounty on wolves be raised, as they are doing considerable damage, and if this were effected many men, now out of employment on account of lack of work in the lumber districts, would go out and hunt the wolves.

During his trip on special patrol in the Haliburton District he found deer very plentiful. Beaver and otter are apparently very numerous.

Ducks, partridge, muskrats and mink have been fairly plentiful.

GAME AND FISHERY WARDENS.

Warden William Burt, of Simcoe, reports as follows:—

Commercial Fish: The fishermen report that the gill net fishing has been good. The seines have been successful. The carp ponds continue to be successful and carp are increasing in Long Point Bay; the price has been much higher than in previous years. A general report of the commercial fish in his district indicate that the catch is about the same as last year, with somewhat higher prices.

Speckled Trout: The catch of this species of fish has been greater than in former years, owing to the planting of fry supplied by the Department.

Brown Trout: The planting of this fish in the brooks in his district has been most successful. These fish appear to be fitted for the streams where the water becomes too warm for brook trout.

Bass: The fishing in Long Point Bay has been as good as in former years, and the fish have been much larger. The hatchery at Mount Pleasant continues to be an unqualified success and the supply of fry was much greater than last year.

Quail and Ruffed Grouse: Quail are increasing in number. Ruffed grouse have increased materially. The birds are more numerous than they have been for a number of years.

Mongolian Pheasants: There are a few of these birds in Norfolk County, but the experiment is on such a small scale that no great results have been obtained. The birds seem to stand the winter well. They are very plentiful in the Niagara district.

Woodcock: There appears to have been a considerable increase in the number of these birds during the present year.

Wild Geese: Conditions regarding these birds are about the same as formerly reported. There are practically none in the district.

Wild Ducks: The Long Point district continues to be about the same as last year; black ducks, mallard, and pintail still being quite numerous. The canvas-back, redhead and blue bills appear in about the same numbers as in former years.

Black Squirrels: There is a large increase in the number of squirrels, particularly in Norfolk County and the other counties where they are being protected.

Fur-bearing Animals: Muskrats continue to increase. The trappers report good catches last spring. Mink seem to be showing some increase.

There have been a number of infringements of the game laws, but on the whole they have been fairly well observed. The Deputy Wardens and Overseers have performed their duties well.

Warden V. Chauvin, of Windsor, reports that he visited all the fishermen in his district and the majority report good fishing. The catches last fall and for the remainder of the year 1913 were very good, especially whitefish and herring in Lake Erie, Detroit River and Lake St. Clair, but up to the end of October, 1914, whitefish and herring did not show up much on account of the warm weather.

There should be a regulation regarding the size of sturgeon, perch, blue pickerel, and white bass that may be taken. A great many of these fish are taken too small.

Sturgeon and perch are very plentiful in Lake Erie and Lake St. Clair. Black bass are plentiful all around the water of the above lakes; the anglers made good catches.

Quail have been reported by the farmers and sportsmen to be very plentiful. The Hungarian partridge, of which the Department have distributed one hundred brace through the Counties of Essex and Kent, are doing fine. The farmers have seen a great many young birds. Other partridge are about the same as in former years; not very plentiful. Woodcock were very plentiful early in the season but very few of them were shot on account of the shooting season opening too late for them, and they had mostly gone south. English pheasants were about the same as other years. Snipe were very scarce last Fall. Black and grey mallard ducks were plentiful in all the marshes of Lake Erie, Lake St. Clair and Detroit River. All the species of ducks, canvas-back, blue-bill, red-head, were more plentiful last season than others in Lake St. Clair, Detroit River and Lake Erie. Wild geese were about the same as other years. Black and grey squirrels in Essex and Kent were very scarce last season, he is of the opinion that a close season should be declared for the two counties. Muskrats promised well last fall, and were building houses in marshes.

Warden G. M. Parks, of North Bay, reports that there has been a general improvement in all the lakes in his district, especially in Lake Nipissing and the French River. The cancelling of commercial net fishing in Lake Temiskaming has met with great favour with the residents of that vicinity, and the restocking of numerous lakes along the T. & N. O. Railway has been much appreciated. There have been a number of tourists visiting the district during the past season, and many of them have reported good catches.

Moose were reported plentiful in many sections, and a number of fine specimens were brought out, but the bad bush fires during the summer made it very difficult for the hunters, many of the old hunting grounds having been destroyed. Deer are very plentiful throughout the district. Partridge are very scarce in some sections, owing to the bad fires of the latter part of May which destroyed large numbers of the young birds who were too young to take care of themselves. Wild ducks were plentiful in some places, but there were very few wild geese. Plover and snipe were plentiful.

Fur-bearing Animals: Beaver and otter are very plentiful. In many places the beaver are causing damage to roads and cultivated lands, making it necessary to have them removed. Mink and muskrats are also plentiful. Wolves seem to be increasing in number, several bands having been reported in the southern parts of his district. Ermine, marten and all other unprotected animals appear to be quite plentiful.

He is pleased to say that the people of his district have afforded great assistance in enforcing the Game Laws, which have been fairly well kept.

The extension of the hunting season in his district met with great favour throughout the north country.

He would like to recommend a general gun license all through the district, as he thinks it would give the officials a better chance to cope with the foreign element, who endeavour to pass themselves off as naturalized citizens. Before obtaining a gun license, they would have to produce the necessary papers in order to obtain the same.

Warden J. T. Robinson, of Sault Ste. Marie, reports:—

Speckled Trout: Very plentiful on the north shore of Lake Superior and in the inland lakes and streams of the District of Algoma.

Bass: All varieties are fairly plentiful and seem to be on the increase in his territory.

Pickerel: These fish are increasing in parts of Lake Superior, and in Lake Huron they seem to be holding their own.

Sturgeon: They are increasing in Lake Superior, but to no great extent.

Rainbow Trout: In the St. Marie Rapids they are fairly plentiful and in some parts of Lake Superior, but if they are not given a close season in a short time there will be none of them left.

Commercial Fish: The fishermen report good fishing. Whitefish and lake trout are more plentiful than they have been for some years past.

Partridge: In his division they are plentiful, but in order to keep up the number in the northern district the open season should be the same as it is for big game, that is from November 1st—15th.

Plover and Snipe: These are very scarce in his territory.

Wild Geese: A few alight on Lake Huron for a day or two on their way to their feeding grounds.

Wild Ducks: All kinds are plentiful in the fall and spring.

Mink: Fairly plentiful.

Muskrats: Very numerous.

Beaver: In the north country they are so plentiful that they are doing a great deal of damage to timber and public roads, and are causing the farmers a great deal of trouble by flooding their farms. He is of the opinion that there should be an open season in 1915 and trappers should be licensed.

Otter: There should be no open season for them in this district in 1915, as they are scarce.

Red Deer: In spite of the numbers killed during the open season, they are very plentiful and are increasing every year.

Moose: Although a great many are killed each year they still remain about the same and are very numerous.

Elk: He has not heard of one in his district.

Bear: There were forty killed between the Soo and Batchawana during September and October. They are very plentiful and no one can tell where they come from.

Wolves: In the district of Algoma they are quite numerous. He suggests that if possible the bounty should be raised to $25, then the trappers would take an interest in catching them. As it is now, with a bounty of $15 and the Department taking the skins, they say it does not pay them.

Guns: He is of the opinion that all rifles should be prohibited during the open season for birds. Shot guns should be used until the big game season opens, then rifles should be allowed for fifteen days, from November 1st—15th.

During the hunting season he had some trouble with hunters breaking the regulations. These parties were fined, which will be a lesson to others.

Great assistance was rendered by the patrol boat "Jessie T." on Lake Superior and part of Lake Huron in looking after the fisheries.

Warden C. N. Sterling, of Kenora, reports that during the year 1914 he visited the different parts of his district several times, and found a decided improvement in the observance of the Fish and Game Laws.

The Overseers at Sioux Lookout and Minaki have been doing good work in the districts under their charge, and have had a deterrent effect on poachers of all kinds.

BLUE-WING TEAL
(*Querquedula Discors*)

Fish: Black bass fishing was about the same as in 1913 in Long Lake, and a number have been caught in the Lake of the Woods.

With regard to commercial fishing in the Lake of the Woods, the catch was the best for three years, although that of the inland lakes was not so good. This, he thinks, was largely owing to the mild fall last year, and the waters were late in freezing up, as mostly winter fishing is carried on in these lakes.

Moose: Moose are very plentiful all over the district.

Caribou: There has been a slight increase in caribou, which came down from the north last season. It is a well-known fact that the big herds are in Patricia and work southward during the cold weather.

Red Deer.—Red deer were fully up to the standard of the previous year; but the brush wolves, which are very plentiful, have been killing off the young fawns in the spring and summer, and unless something is done to diminish their numbers, he expects to see a decrease in these animals.

Beaver and Otter: Beaver are increasing very rapidly, and there is ample evidence of this in the number of dams which have been built by them. In some cases they are a nuisance to the railroads and lumbermen.

He has seen many indications of otter throughout the district; but it is rather difficult to form any opinion as to their increase or decrease.

Mink and Muskrat: Mink and muskrats are fully up to the standard of last year. The principal difficulty he has is preventing the Indians from breaking open the muskrat houses in the close season as well as in the open season.

Grouse and Partridge: Partridge are very scarce and he does not know why this should be so, as in places where no shooting is done the same condition prevails, and those that are killed are principally old birds.

Grouse or prairie chicken are about the same as last year, but they are only to be found in the western part of the district.

Ducks and Geese: These birds are scarce on the Lake of the Woods. This, he thinks, is principally due to the higher water which has flooded the rice fields. There probably will not be any increase until the wild celery which has been planted has a chance to grow. In other parts of the district they are about the same as usual.

Wolves: As intimated above, he finds that brush wolves are very numerous, and, in fact, are a menace to the children of the settlers who are going to school in outlying districts.

In conclusion, he would suggest that a bounty of Five Dollars per head be paid on brush wolves, as he thinks that this would be a sufficient inducement for trappers and others to go after them. There is no doubt but that they are a serious menace to the increase of the game in his district.

Warden J. H. Willmott, of Beaumaris, reports that at the commencement of last season anglers did not meet with very good success, but as the season advanced there was a marked improvement, and during September he saw several strings of bass taken in the Muskoka Lakes which compared very favourably with the catches of thirty or forty years ago.

Those interested in the hatchery at Port Carling had very poor success in the propagation of pickerel this year. He believes that it would be most advantageous if the Department could see its way clear to take over this hatchery and remove it to Bracebridge, at which place spawn could be procured on the spot and the fry shipped to any point by rail. One great advantage would be that at Bracebridge

there would be an unfailing supply of running water, whereas at Port Carling they are dependent on a supply from a tank which is provided with a gasoline engine.

While up the Georgian Bay in October, he was surprised to hear that the lake trout were not then on the shoals. These fish generally come on the shoals about the 8th or 10th October. The same thing occurred in the inland lakes. The reason assigned was that owing to the mild fall the temperature of the water kept high and the fish remained later in the deep cold water.

The distribution of bass fry from the Brantford hatchery was again successfully carried on this year, and the results of former years restocking from this source is very apparent in many waters.

Deer are reported about the same as regards numbers in most places. He is pleased to note that in many sections formerly hunted over and then discarded on account of scarcity of deer, they are again increasing. He thinks it most advisable that districts in which there is a scarcity should be closed for hunting purposes for a term of years.

Partridge are plentiful in some sections, but he invariably notices that there is a shortage in the proximity of summer resorts, which leads him to believe that many are killed before the season opens by some of the unsportsmanlike visitors, with their little "22" rifles, which they bring up partly for this purpose, and the reports of which cannot be heard at any great distance.

He was agreeably surprised last season at being shown a woodcock by a friend which had been shot in the neighborhood. This was the only specimen he had heard of so far north for many years.

Beaver are increasing to such an extent as to be a perfect nuisance in places, drowning out land, flooding roads, etc. He thinks the Department would be fully justified in throwing open the season of 1915 for these animals, which have been protected since 1891.

The laws, he is pleased to say, have for the most part been well observed. Most of the cases of infractions that he has had have been with regard to fur.

Warden D. D. Young, of Port Arthur, reports as follows:

Moose: Very plentiful and increasing.

Red Deer: Increasing very rapidly in certain districts, viz., south-east of Port Arthur and west from Atikokan.

Grouse (Partridge): In some places plentiful, in others scarce.

Hares: Plentiful in some parts. The only way I can account for the scarcity in some places of grouse (partridge) and hares is the increase of wolves, owls, hawks, crows, red squirrels and weasels.

Ducks: Increasing.

Geese: Scarce except south end of Lake of the Woods.

Snipe: A few in places.

Woodcock: Nil.

Wolves, timber, brush and coyotes: Increasing and very destructive to game.

Beaver: Increasing very fast (plentiful).

Mink, Weasels (Canadian Ermine): Fairly plentiful.

Muskrats: Increasing in some places.

Lynx: Numerous.

Otter: Increasing.

Foxes: Numerous, a great number were trapped last spring and shipped to breeders out of the Province.

Fish, viz.: White fish, pickerel, lake trout, northern pike, suckers and herring, west of Lake Superior and in the inland lakes of Thunder Bay and Rainy River, plentiful in spring and autumn, but fell off considerably during the summer months.

Speckled Trout: Good fishing in some lakes and rivers. I would strongly recommend that Mackenzie River be protected for the next three years.

Black Bass: Good in a few lakes.

Again I recommend that the bounty be raised on timber wolves, and also a bounty be given for brush wolves and coyotes. Also that trappers be required to take out a license and districts allotted to them.

As you can judge from the number of convictions, the law has not been kept, but from the many interviews I have had with numbers of people, I have reason to believe the lawbreakers are beginning to realize that they cannot ruthlessly go in the way they have been doing. Owing to it being a new country settled principally by foreigners, it takes time and patience to deal with them.

Special Game and Fishery Overseers.

Overseer Daniel Blea, of South River, reports that the fishing in the northern part of the Province has been very good.

Deer appear to be very plentiful. They were in splendid condition last season as the winter preceding was a splendid one for them. There being no crust on the snow the deer in many places did not yard up.

With regard to partridge there were a great many early bush fires in the spring which destroyed a number of eggs. He strongly recommends that there should be a close season for partridge for two years.

He has much pleasure in testifying to the valuable assistance a great many settlers and inhabitants are giving in enforcing the game laws.

Overseer A. Drouillard, of Walkerville, reports that the fishermen in his district seem pleased with the results of their work during last year; while the catch was not equal to some years, owing to the good prices obtained, general satisfaction exists among the fishermen.

He is also more than pleased to report that notwithstanding the large number of consignments of fish inspected by him at Windsor and Walkerville, in no case did he find any violations of the law.

Overseer Henry Watson, of Toronto, reports that the licensed fishermen of the vicinity of Toronto had a somewhat better season than the previous year. They would starve, however, if they had to depend on fishing for a living, so they are all forced to find other means to make ends meet.

There must be something wrong in the method of restocking the waters on the lake front, for the fish taken in the lake opposite the Counties of Durham, Ontario, York and Peel in the last ten years, all put together, would not amount to a good catch for one season.

Rod fishing does not improve either, he does not know if it is on account of the number of dredges working, or the motor boats running day and night, or the pollution of the waters, but the fish have nearly all left the Bay, even the carp that used to be so numerous only visit these waters in any quantity during the spawning season.

Both the licensed fishermen and the large fish companies respect the laws more than formerly, and appear to have discovered that it does not pay to catch fish before they have had an opportunity to reproduce.

The number of illegal shipments decrease every year and the same may be said of both fur and game.

Returning deer hunters reported deer as plentiful as ever in most places; very few parties returned without a deer apiece. The deer that came in were the best seen for years. The great majority were bucks; there were very few does and fewer fawns than ever before.

Partridge, during the first two weeks of the season were reported as fairly plentiful, but later on the deer shooters found things entirely different, and quite a number of them blame the summer tourists for the scarcity.

There is no doubt but that a lot of illegal work is done by the tourists, a great many of them take shot guns and small rifles into the country with them and shoot everything in their vicinity.

GAME AND FISHERY OVERSEERS.

Addington County.

Overseer W. J. Donaldson, of Donaldson, reports that fish are quite abundant in all the lakes which have been stocked by the Department and private individuals, but there are yet many lakes in his district which are well adapted for raising game fish, in which there are none of any value.

Deer appear to be very plentiful this fall, but the wolves are also very plentiful and are destroying many domestic animals, especially sheep and calves. He is of the opinion that many of them come from the Algonquin Park. Partridge are plentiful. Ducks are scarce. Fur-bearing animals, such as mink, fish, otter, beaver and muskrats are almost extinct. He would recommend that they be given better protection.

Overseer John T. Irish, of Vennachar, reports that deer are quite plentiful, also partridge and ducks. Muskrats seem to be on the increase. He is of the opinion that it would be advisable to charge a small license fee for trapping muskrats. He thinks that a higher bounty should be put on wolves, in order to rid the district of them; deer would then be more numerous.

Overseer H. R. Purcell, of Colebrook, reports that the catches of bass, pickerel and pike have been good.

He finds that the mill owners on the different rivers in his district, are taking good care of the sawdust and mill refuse.

The bass fry for Beaver and White Lakes arrived in splendid shape and were as lively as bees when they reached Erinsville Station. In some forty years' experience under the Dominion and Provincial Governments, he never received fry in such good condition.

Ducks are plentiful this fall.

He is pleased to note that fur dealers are required to take out a license, and thinks trappers should also be licensed. He would recommend that persons hunting for small game should pay a license of one dollar, and that there should be a close season for partridge for three years.

Overseer William Young, of Cloyne, reports that angling for both trout and bass was excellent. Bass are increasing in the lakes stocked by the Department some years ago.

Deer are more plentiful and he disposed of more resident deer licenses than he did in 1913. All parties except one, obtained their full complement.

Muskrats and mink are scarce. Partridge are not so numerous as the previous years on account of the bush fires in the spring which probably destroyed the young birds.

Algoma District.

Overseer J. R. Bradbury, of Blind River, reports that the catch of fish was quite as good as in 1913. There was a falling off in some localities, but taking the district throughout the catch was about the same. Whitefish fell off somewhat but other varieties, such as pickerel, trout, mullets, pike and sturgeon were as plentiful as ever. Very few perch were caught except in the western part of his district. The pickerel catch, which is most important, was very good and the fish of good size. Trolling and angling were better than usual in some of the small lakes and streams, and some splendid specimens of bass were taken. In some small lakes pike seem to be killing the other varieties; dogfish are also doing considerable damage.

Red deer seem to be fairly numerous, though the wolves are doing a great deal of damage. Carcasses of deer may be seen partly devoured or with nothing left but the bones. If wolves continue to increase as fast during the next year or two, deer will be driven out entirely. He strongly advises that the bounty for wolves be increased to $20 each.

Moose are quite numerous in some localities, and spendid specimens are seen from time to time. Wolves do not seem to trouble moose as he has not known of any case in the district where they have killed them.

He would advise that the open season for red deer, moose and caribou be changed to read from November 10th to December 10th, for the meat would keep better and there would be less wasted.

Ducks are not numerous and partridge are scarce. Mink and muskrats show little change, not many being trapped on account of lower prices. Beaver are increasing.

Overseer H. Edwards, of Nairn Centre, reports that the fish seemed to be plentiful, though there were not so many tourists.

Last season there was no scarcity of deer in this district which was visited by a large number of hunters who went away satisfied with what they had procured. While there are plenty of deer, moose are rarely seen. Partridge are very scarce. Muskrats and mink are fairly plentiful. Beaver are very numerous and have to be watched very closely.

Overseer Charles Fitzsimon, of Sault Ste. Marie, reports as follows:

Fish.

Bass: One or two only of the lakes along the Algoma Central Railway contain black bass. In the waters along the Algoma Eastern Railway, however, there is the finest of bass fishing—McGregor Bay, Bay Fin, and in the many reaches of the Grand Manitoulin Channel in the vicinity and north of Little Current.

Maskinonge: The above waters produce these fish in abundance.

Pickerel: May be taken in the waters extending from Little Current to the Soo.

Brook Trout: There are very few streams crossed by the Algoma Central Railway in which trout do not abound, and the constantly increasing number of anglers indicate what splendid sport is offered throughout the district.

Lake Trout: Many of the inland lakes contain this fish in abundance.

Sturgeon: Very few are now taken. A record fish was caught in a net near Little Current this last season. If I remember rightly, the fish weighed 284 pounds.

Game.

Moose: Are found from the Soo north along the Algoma Central Railway to the northern terminus at Hearst. The portion of country between Franz and Hearst, 100 miles, has been opened only during the last two years and moose are numerous. Very little hunting has been done in that portion of the country which has been practically inaccessible up to this time. In the district from the Soo north 200 miles, moose do not seem to be keeping up their numbers. There are fewer bulls than cows, and are young and small; the old bulls seem to have been killed off during the last few years.

The portion of the Algoma Eastern Railway between Nairn and Little Current runs through a good moose country.

Deer: Are numerous along both railway lines, especially from the Soo north some sixty miles and on the Algoma Eastern Railway between Victoria Mines and Little Current, particularly in the limestone country north of the latter point.

Grouse: This has been a good year for ruffed grouse. Broods have been large and numerous.

Spruce Partridge: Broods have been large and numerous.

Woodcock, Quail: Do not make their habitation in the northern country.

Prairie Chicken: It is interesting to find a few scattered coveys in the "burns" in the vicinity of Oba and Hearst. These birds are the true prairie chicken, and probably find their way from the western prairies.

Swans, Geese: Found only infrequently, a few scattered flocks dropping into inland lakes to rest and feed on their southern flight.

Ducks and other water fowl: The inland lakes and quiet waters of the district offer splendid nesting places for wild ducks and plover. Broods are raised and fly south on strong wing, often before the season opens, and those who benefit are our southern neighbours.

The St. Mary's River, the Grand Manitoulin Channel and many inland lakes lying close to the north shore of Lake Huron, offer good duck shooting. Further east, especially along the Algoma Eastern Railway, the many bays and reaches north of Little Current, make splendid feeding and hunting grounds for wild ducks and plover. The latter bird, however, flies south early.

Snipe and Rail: Are never seen in this northern district.

Hares: Are plentiful, especially in the country lying between 200 and 250 miles north of the Soo.

Caribou: Have been found in a few scattered bands north of the Canadian Pacific Railway and south of Oba.

Fur-bearing Animals.

Beaver: Have become very numerous. The wise legislation in giving them a close season for years has allowed them to increase rapidly, and observation shows that nearly every creek in the district contains beaver. A dozen dams may be seen in an hour's walk and in many places damage has been caused to the roads. It would appear to be quite safe and even desirable to make an open season once more for beaver.

Otter: Are very scarce and its protection should be extended indefinitely.

Muskrats: Do not seem to be holding their own in the district.

Mink: Are few and scattered.

Wolves: While of late years great numbers have been taken by poison and possibly as many more have been killed in this way and the bodies not found, it is a fact that these animals remain numerous in the district, and are a menace to the woodsmen as well as vicious destroyers of large and small game at all times. One wolf will account for about a dozen deer in a season. The value of one deer to the Province is at least fifty dollars. Every wolf accounted for means the preservation of many deer to the Province, a sure means of revenue. A bounty of fifty dollars would make it worth while for trappers and woodsmen to hunt them and would assure their quick extermination. As it is, the steps to be taken by a wolf hunter in order to secure the bounty, are so many and tedious that frequently his expenses offset the amount of the bounty and as a consequence he makes no special effort towards the destruction of "the pirate of the pines."

General.

Owing to the large number of foreigners employed on railway construction in the district during the last few years, there have been considerable infractions of the game laws, though there have been few convictions, it being very difficult to secure evidence sufficiently conclusive to place the culprits "where they belong."

It was endeavoured, however, by taking away all weapons in possession of foreigners, to render them incapable of doing damage. The construction having been completed this cause has been removed.

The laws have been observed fairly well, but some people are so constituted that while they would not think of contravening the criminal code, they will without compunction break the game laws.

Overseer V. J. Jewell, of Batchawana, reports that the fishing was better last year than in 1913.

Fur-bearing animals show little change.,

Deer and moose are scarce.

Beaver are very plentiful and in some places are doing a lot of damage.

Wolves are very plentiful and something should be done to exterminate them. Possibly this might be done by raising the bounty to $25.

Overseer P. W. Kent, of Kentvale, reports that there are less fish than last year in the small streams. Trout fishing is nearly a thing of the past. This he thinks is due to the fact that there are a great number of cranes nesting near the streams and they catch the fish. In the lake the fishermen say that the fishing is about the same as last year, but near the International line they are caught in trap nets before they have time to grow. He has been able to find two trap nets and is learning where he is most needed.

There were not many tourist visitors on account of the war, only about one-third of the cottages along the shores being occupied, and those who did come did not come to angle.

Game is increasing on the island slowly. Last year moose and deer were not so plentiful as this. Ducks and partridges are about the same. Beaver are very plentiful, also bears. Muskrats seem to be increasing.

Brant County.

Overseer W. W. Jackson, of St. George, reports that he notices an increase in game. Squirrels, black and grey, are plentiful, and there are more partridges than last year. Cotton-tail rabbits are also very plentiful. He is of the opinion that there should be a trappers' license.

Overseer Henry Johnson, of Brantford, reports that angling in his district was not very good during the early part of last season, but later bass and pickerel fishing was good and trout were about the same as the previous year. Coarse fishing was good.

Black and grey squirrels, also rabbits are on the increase. Duck and woodcock are about the same as last year.

Muskrat and mink are more plentiful, and there seem to be more coon than usual.

There are four dams on the Grand River in his division which are not provided with fishways.

The Overseer gratefully acknowledges his indebtedness to the Deputy Game Warden and the public for the assistance they have given him this year in his efforts to have the laws observed in his territory.

Overseer J. F. Kern, of Burford, reports that the fishing has been lighter than usual, due no doubt to everyone being busy during the fishing season.

Game is more plentiful than usual, there being a number of partridge. Rabbits are not so plentiful. Muskrats are reported to be very plentiful.

There were no infractions of the Act. He was called away on one or two reports of illegal fishing, but found no foundation for them upon investigation.

Bruce County.

Overseer Daniel Kehoe, of Millarton, reports that game is very scarce in his division.

Overseer John Trelford, of Southampton, reports that net fishing was good, better than it has been for years, and the weather up to the last week in October was favorable.

Angling was not as good as it was other years.

Rabbits and muskrats are plentiful, while black squirrels are scarce in this district. Ducks were more plentiful than they were other years. Beaver and mink are fairly scarce.

Carleton County.

Overseer Adam Greene, of Kinburn, reports that though the early part of the season was too cold, the fishing was good after July 1st.

Bass, pickerel and coarse fish of all kinds were plentiful.

Deer, partridge and ducks are plentiful.

BROWN TROUT—*Introduced*
(*Salmo fario*)
SPECIMEN FROM GRAND RIVER

Overseer E. T. Loveday, of Ottawa, reports that more night line licenses than usual have been issued, all to city residents who move out to the country for a few months, and live in cottages, tents, etc.

Angling was never so poor in the Ottawa River. He does not think there were less fish, but that owing to the water being so very low, the fish were lying out in the deep water in cool spots. The pickerel that were caught were very small, from ten to twelve inches, and, in accordance with the Dominion regulations, were returned to the water, but only to die. Pickerel that are caught on night lines swallow the hook, and of course die.

Rabbits (hares) were very plentiful during the fall of 1913, and although a great number were killed at that time, they seem to have been as abundant in 1914.

Partridge are becoming fewer every year. Overseer Loveday believes this is due to their being killed at all times in the outlying districts.

A great many fine deer were brought into and shipped through Ottawa last season.

He made two trips down the Ottawa River and seized a number of nets.

Overseer William Major, of Woodlawn, reports that last season was very good for fishing, pike, bullheads and sunfish being plentiful, though bass and pickerel were scarce.

Ducks were in abundance, but few geese were to be had. Deer also very scarce. Beaver were still in the creek, though they had moved half a mile down where they had built a large dam and had cut into trees about a foot in diameter. He thinks they should be protected for another three years after the present close season has expired, as they could do no harm in the creek which is bordered by drowned land on both sides with no arable land near. Partridge were scarce.

Dufferin County.

Overseer George Moffatt, of Glen Cross, reports that the fish in his district are mainly trout and suckers. Trout were as plentiful as in former years in the small streams.

Partridge and rabbits are quite plentiful. Muskrat and mink are not so numerous on account of so many traps being used. He would recommend a close season for muskrat.

Overseer John Small, of Grand Valley, reports deer are increasing in the marsh on account of the close season. He finds that red foxes are very plentiful. Mink and muskrats are scarce. Rabbits are plentiful.

Speckled trout are scarce on account of the dry season.

Dundas County.

Overseer N. W. Davy, of Morrisburg, reports as follows:—Partridge have been reasonably plentiful, but illegal shooting has been going on for some time prior to that allowed by law. Hares are fairly plentiful, but evidently not much hunted. Other game is rare.

The St. Lawrence has great possibilities as a fishing ground. Almost every kind or at least a large majority of the kinds of fish found in Ontario waters are to be found here; and with measures to eliminate objectionable kinds and pro-

tection for game fish, the St. Lawrence should make an ideal sportsman's ground. In his district are to be found some maskinonge, bass, pickerel, pike, perch, chub, numerous eels, suckers and mudcats.

Since his appointment on October 1st he has been attempting to acquaint the public with the existing regulations with evident results, but much work yet remains to be done.

Durham County.

Overseer Robert Elliott, of Port Hope, reports that the catch of whitefish was much better last summer than the previous one, but salmon trout showed no increase. Angling in the harbour was very good; perch, bullheads, eels and carp being the chief fish caught.

He recommends that the close season for brook trout be from September 1st, as after that time they begin to ascend the streams to spawn and are easy to catch; in fact, many were caught while ascending the streams.

The automobile spells the extinction of trout and squirrels in his district.

Partridge, black squirrels, wood hares and cotton-tail rabbits are quite numerous. Ducks are not very plentiful. Trappers report that muskrats and weasels abound, but that mink are scarcer.

Overseer S. G. Pickell, of Bowmanville, reports that the fishing in his territory was very good, trout, whitefish, herring, bass and pike being about as numerous as other years.

With the exception of some illegal fishing in Bowmanville waters, he had no occasion to fine anyone.

Rabbits, owing to the scarcity of foxes, were very numerous.

It being a dry summer, partridge increased considerably. Ducks and muskrats were plentiful.

He would strongly recommend that all hunting dogs be kept under control during the breeding period of hares and cotton-tail rabbits, and if found running at this period that such dogs be shot.

Overseer C. Twamley, of Cavan, reports that though the bass were late in coming up last season, there were as many as usual and they were not molested. They did not leave until the end of June. Trout are not so numerous as other years.

Partridge and black ducks were very plentiful.

Mink are scarce, but muskrats are numerous. Black squirrels and hares are very plentiful.

Overseer John Watson, of Caesarea, reports that fishing was better last summer than it was a year before. There do not appear to be many large bass, but a great many are to be seen from four to ten inches long. He is of the opinion that the number of maskinonge allowed to be caught by one person in a day should be two and the number of bass four. He finds that speckled trout are becoming extinct in most of the creeks in his district and he thinks they should have a close season for at least two years, and at the end of that time, the open season should be from May 1st to September 1st.

Ducks, rabbits, partridge and shore birds are very plentiful. There is no large game in his district. There are a few mink, but the open season is too long and should be shortened to the months of November and December which

would give them a chance to increase. Muskrats are plentiful, but he would advise that their open season be during the month of April, as they are so much more valuable in the spring and it is a waste to catch them in the fall.

He thinks that all local trappers should pay license fee of $5, and that there should be a gun license of $1 for all except farmers shooting on their own farms.

Elgin County.

Overseer K. McClennan, of Grovesend, reports that the catch of whitefish was very fair. During the fall of 1913, the catch of herring was very short, but in the spring it was about the average. Perch and blue pickerel were very good. Although the catch was not a large one, prices were exceptionally high and on the whole it was a very profitable year for the fishermen.

The fishing laws and regulations were well observed, only one violation, i.e., fishing a dip net without a license, having come to his notice. He had the offender brought before a Justice of the Peace and fined $10 and costs. The game laws were well observed.

Game is very scarce. There are fewer black and grey squirrels than there have been for years. There are quite a number of partridge. Quail are almost extinct. Muskrats are about the same as last year.

He suggests that the open season for black and grey squirrels and partridge be at the same time as it would make it a great deal easier for the overseer to protect the game and a man would have no excuse for being found in the woods with a gun until the 15th November.

Essex County.

Overseer Charles Coultis, of Leamington, reports that grey and black ducks are holding their own as to numbers. They remain most of the season and hatch in Pelee Marsh, leaving in the fall for the south. The blue bill and red heads are not plentiful in his district, and remain there only a short time for food when passing to and fro. Wild geese are not found in great numbers, being somewhat like the blue bill and red head ducks, who only stop to feed while passing.

The close season for quail will be the means of increasing their numbers next year, but they were scarce having been much killed off a few years ago by the very hard winter. The Hungarian partridges, from all reports, seem to be on the increase. They have become acclimatized and are doing fairly well.

Black squirrels are somewhat on the increase since they have been protected by the close season, but they are still very scarce.

The fishermen report a very light catch both spring and fall.

Overseer H. A. Henderson, of Pelee Island, reports that fish are on the increase in his district, especially whitefish. Angling has not been very good, although he sold more permits than other years.

Game is very scarce with the exception of wild geese which were very plentiful in the fall and spring.

Overseer Remi LaFramboise, of Ojibway, reports that fishing for whitefish was rather poor this fall, caused he imagines, by the fine weather, and the fish not having entered the river as early as usual. Carp fishing was not quite so good as in 1913, though three or four of the fisheries did fairly well. All other kinds of fish, such as perch, pickerel and bass seem to be holding their own.

The anglers appeared to be well satisfied with their catch during the last season, and the sale of permits increased considerably.

Ducks were quite numerous in the Detroit River last spring. There were red heads, blue bills and canvas backs, also other kinds of river ducks. During the beginning of September, he noticed a great quantity of black and grey mallard ducks in the marshes of the islands along the Detroit River. Quail were quite numerous last fall. He has seen no less than six or seven bevies himself during the autumn. Black and grey squirrels are very scarce on account of the small amount of timber land. Muskrats and rabbits are numerous.

Frontenac County.

Overseer M. Avery, of Sharbot Lake, reports that the fishing was very good last season. He finds that by keeping a close watch over his division he is able to prevent many from breaking the law.

Partridge were very plentiful last fall, but ducks were fewer than the previous year. This should be a good fall for the hunters as deer are more numerous than last year.

Overseer George Barr, of Harrowsmith, reports that angling in Fourteen Island and Long Lakes was excellent and in Rock and Silver Lakes, fair. In Desert Lake, angling for salmon and bass was good, and in Mud Lake for bass, above the average. In Long, Silver, Rock and Napanee Lakes, the pike are infected with cancerous sores due to high water.

First Depot Lake having only pike, catfish, suckers and small bass in it, while being suitable for pickerel, he would advise having it stocked with this species of fish.

On April 20th he placed twenty pickerel in Loughboro Lake for stocking purposes, and expects good results.

Trapping was poor last season owing to weather conditions. He would advise lengthening the trapping season and charging a small license fee.

Game of all kinds is increasing.

The number of tourists who visit this district is steadily growing, the permits sold last season being four times as many as the preceding year.

Overseer Matthew Cox, of Howe Island, reports that some of the anglers say the bass fishing was a little better than in 1913.

Ducks were not so plentiful as in former years on account of the mild weather.

Muskrats are becoming very scarce.

Overseer Henry Drew, of Long Lake, reports that the fishing has been the best in his district for some years.

Partridge are very plentiful. Black squirrels are becoming plentiful which is something new for this distict.

Overseer George Gates, of Kingston, reports that the fishing was as good as in former years. Dog and other coarse fish are very plentiful and he is of the opinion that the waters should be rid of them.

Partridge are very scarce this season, but ducks were about the same as in former years. Muskrats are very scarce owing to there being so many trappers. He thinks there should be a trapper's license to prevent so many muskrats being caught.

Overseer Henry Holliday, of Wolfe Island, reports that the fishing in his district was good. Bass fishing was good all the season, and the fish were a fine size, some excellent catches being made. Pike were very plentiful and large. Maskinonge afforded good sport and one angler caught as many as three in one day. The net fishermen made some fine catches of whitefish and salmon trout. The hoop net fishermen report a profitable season, as the catches and prices were both good.

There were fewer anglers on the River St. Lawrence last season than in former years.

Wild ducks were never known to be so plentiful as they were in the spring. The rivers and bays were full of all kinds for about two weeks. They were very scarce last fall until about October 25th when they came in great quantities.

Muskrats are becoming very scarce. He would recommend that the trapping season should not open until the middle of March, then there would be no breaking of houses or runways.

Overseer J. A. Kennedy, of Tichborne, reports that the fishing in the water of his district continues to be as good as formerly, and owing to the Public Works Department having expended $300 on drainage work between Crow and Bobs Lake, there will be an increase in the number of tourists visiting the district.

The fish to be found in those waters are black bass, salmon, pickerel, pike, rock and sunfish, herring, whitefish, bullheads, suckers, lyng, eels and perch. Anglers were well satisfied with their catches last season.

Partridge are plentiful, ducks very scarce, and all fur-bearing animals are decreasing. There are a few deer.

Overseer Thomas Marsh, of Collins Bay, reports that since his appointment last April he has visited the lakes and streams and the abodes of game and fur-bearing animals in his district and has found the law well observed by Canadian citizens, but not always by the Americans, whom he found very hard to apprehend. They have fast motor boats and are able to get away before he can reach them.

Fishing has not been any too good, bass in particular being scarce. Eels were quite plentiful in June and some good catches were reported.

Partridge are more plentiful than last year, but ducks were very scarce, perhaps on account of the open fall. The licensing of all trappers would, in the overseer's opinion, be a move in the right direction. Muskrats were quite plentiful and a few raccoons, skunks and foxes were caught but they were quite scarce.

Overseer F. L. Wormwith, of Arden, reports that the fishing was fairly good this year in most of the lakes, although the waters should be restocked. A great many tourists visit his district every year.

Deer were quite plentiful and almost all the hunters obtained the legal number. He had no trouble during the season with parties hunting without licenses as he had in former years. Partridge have been fairly plentiful. Ducks were very scarce. There were fewer hunters from outside the Province this year, but more residents.

The people of his district think it would be better if the open season for deer commenced on November 15th instead of the 1st, as a great many deer are wounded and get away, being often found later where they have died. Two weeks later there would be snow and the deer could be tracked.

The overseer had some trouble with parties trapping out of season and had them brought before a Magistrate. Two convictions resulted which had a good effect as a warning to others. He also had trouble with parties who allowed sawdust to run into the river, but he succeeded in having the practice stopped.

Grenville County.

Overseer J. H. Boyd, of Merrickville, reports that coarse fish are about the same in number as during the last two years, but black bass, pickerel, and maskinonge have increased wonderfully. The tourists seemed quite pleased with their fishing this season.

Deer have become quite plentiful, especially in the northern district. Wild ducks were more scarce last year than they have been for some time, but partridge are very plentiful. Muskrats are plentiful, but he found them very hard to protect. So many of the houses have been broken into, but he hopes, under the protection of the law, that they will be preserved much better in the future. Mink are numerous, but black and grey squirrels are very scarce in his division.

Overseer James A. Fraser, of Prescott, reports that the past season was the dullest for years, the fish being more scarce than ever, with the exception of yellow pickerel, which seem to be increasing.

Ducks are becoming more plentiful, but other game is very scarce.

The law has been fairly well observed, he only seized two nets and two night lines, which is very few in comparison with other years. There was some Sunday shooting, but he succeeded in catching six different law-breakers, whom he fined $5 each. This, he thinks, will put a stop to the illegal work. He also fined one man for keeping undersized pickerel $10.

Grey County.

Overseer James Gillespie, of Berkeley, reports that there are a great number of inland lakes and streams in his territory where speckled trout are to be found, and that he is giving particular care to prevent the illegal taking of these fish.

He has had the regulations posted up around the lakes and along the streams, also in public places where they would be seen.

In May he deposited thirty thousand speckled trout fry in Ewart's Lake, which connects the Bell's Lake and several others in the Townships of Holland and Glenelg.

As usual, quite a number of people were camped around those lakes during the summer but anglers were not very successful, very few trout being taken in any one day.

Partridge seem to be plentiful, while ducks are scarce.

Hounds can be heard in the swamps every day during the spring, and certainly do a great deal of damage to hares.

Most people in this division know the law, and, as far as game is concerned, he believes it has been fairly well observed.

Overseer Thomas McKenny, of Thornbury, reports that last spring, acting under instructions from the Department, he met patrol boat "Lotus" at Penetang and patrolled the north shore of Lake Huron looking for trap nets. He

regrets to say that they were about a week too late, as the pickerel run was unusually early, and though they found many evidences of recent trap net fishing they obtained no nets.

The fishing in his district was fairly good during the spring, but lighter than usual in the summer and unusually bad last fall, some fishermen not securing enough fish to pay for their license. This falling off was caused by the exceeding inclemency of the weather, and the fish being very late in coming on to the shoals to spawn. Of late years the fish have not come on the shoals in the fall until about the last few days in October, while further north there is good fishing for two or three weeks before the season closes. In justice to license-holders he would suggest that an extension of time be given the fishermen on condition that they collect all spawn and deliver it to the Government for use in the different hatcheries. He feels sure this condition would be faithfully carried out, as it would be to their interest to do so, and it would keep up the supply of fish in the bay.

The law has been well observed, and in patrolling the bay he has found all buoys properly set and marked, the seizure of nets illegally set during the last few years seems to have taught the fishermen a lesson.

Overseer James Myers, of Holstein, reports that the chief fish in his district are speckled trout and bass. There are three trout reserves in his division. Angling was about the same as the previous year, fair, and all the fish caught were used at home. There were no violations of the Fisheries Act that he was aware of.

The game found in the district are mostly hares, partridge, ducks and some deer in Proton and West Luther, also some mink and muskrats.

There were no violations of the Game Laws, which he attributes largely to having his district fairly well posted with the Game and Fishery Laws, so that the people know the seasons for fish and game and the more important regulations.

Haldimand County.

Overseer J. W. Lee, of Wellandport, reports that both gill net and pound net fishermen had an average year. Last fall was reported to be the best they had had for several years. Herring were quite plentiful. Perch, pickerel and coarse fish were up to the average. White fish were plentiful.

The last was not such a good season for tourists as usual, and there was not so much angling in the Grand River. He thinks it was on account of the cold spring.

Quail are very plentiful, but there are no woodcock or plover. Partridge and pheasants are very scarce. What few pheasants there were, were pretty well shot off, for the hunters do not pay much regard to the sex.

Wild ducks were quite plentiful, and a number of wild geese harboured in his district last fall.

Black and grey squirrels are quite plentiful, though they are very hard to protect. There have been some complaints that duck hunters shoot squirrels, but it is very difficult to track the guilty parties. Muskrats are fairly plentiful, but mink are very scarce.

Cotton-tail rabbits are very numerous, but there are very few hares. The former have become a nuisance as they destoy many small fruit trees and shrubs by girdling them.

Overseer James Vokes, of Nanticoke, reports that the Fishery Laws have been well observed, and he has no infractions to report.

The gill net fishermen from Port Dover had good catches of whitefish, but the fishermen operating from Port Maitland did not do so well.

The whitefish appeared to be on shore in good quantities last fall, but owing to the high wind which prevailed almost every day the pound net men had difficulty in getting out to their nets.

Herring and pickerel (blues) were very plentiful and quantities were placed in the freezers, as the market was well supplied. Perch and coarse fish were well up to the average. Sturgeon were about the same as usual.

Black squirrels have greatly increased and are now quite plentiful. He had no trouble so far last season with persons shooting them illegally. The sharp fines inflicted the previous year having evidently had a good effect.

Muskrats appear to be as plentiful as ever. In his opinion, which is backed by responsible fur buyers, muskrats should not be taken before the first of February. A large quantity of the rats taken early in the season are only half-grown. Such a regulation would also make it much easier for overseers to take care of the rat houses and see that they were not interfered with.

Mink keep very scarce, and are mostly trapped along the Grand River.

Quail are not very plentiful, but partridge appear to be steadily increasing in numbers and have been seen all through the county.

Ducks did not appear to be in such numbers as the previous year.

If the trappers were licensed, Mr. Vokes is of the opinion that it would greatly simplify the duties of the Overseers, and would have a marked effect on the proper observance of the Game Laws. It is not the bona fide trappers that cause the trouble, but the casual trappers, who take a few furs here and there with no respect for the close seasons.

Haliburton County.

Overseer Manly Maybee, of Cameron, reports that maskinonge fishing was fairly good, especially during September and October. Bass were not so plentiful as in 1913.

There was a great many mink and coons caught during the previous season. He is of the opinion that the close season for mink should be from March 1st to November 15th, as their fur begins to fade in March. A large number of muskrats were caught in the spring, but their houses are as numerous as ever. Partridge and rabbits seem to be as plentiful as ever. Ducks were scarce during the early part of the season but more numerous in October. There are no deer or black squirrels in his district. Frogs seem to be becoming more plentiful.

He has kept a close watch over the fish during the spawning season and the ducks during the close season. He finds that people are awaking to the fact that it is to their interest to see that the Game and Fishery Laws are well observed.

Halton County.

Overseer W. Sargant, of Bronte, reports that the catch of herring, the main fish in this district, will probably show an increase when the returns are all in. Whitefish did not seem to be so plentiful, but some very nice catches were made. Trout were about the same as in 1913. The fishermen all use a large mesh net

of about six inches. They have had very favourable weather and there have been few nets lost during the past year. All the fish taken have been disposed of for the home market and the prices have been fair.

Angling in the Twelve and Sixteen Mile Creeks has been about the same as in former years.

He would strongly advise that everyone who goes hunting or shooting in the woods should be obliged to take out a license at a small fee, as there are a number of people, especially foreigners, who come out from the city to shoot rabbits in the season, and it is hard to protect squirrels and partridge from such people.

As there is now a close season for black and grey squirrels and partridge in the County of Halton, he has kept a close watch and has been through the bushes many times. He is pleased to report that squirrels and partridges are both increasing.

Hastings County.

Overseer H. C. Armstrong, of Glen Ross, reports that he visited the Grand Trunk Junction and the Canadian Northern Railway Station several times and inspected shipments of fish and found them satisfactory. He seized one gun from some Italians and had reports of others, but he was unable to locate them.

Maskinonge, bass and pickerel fishing were not so good as formerly. This he considers due to there being no slides in the dams from Trenton to Glen Ross. Sturgeon are very plentiful in his district, they were seen by the dozen during the spring at Glen Ross, near dam No. 7.

Winter ducks were very plentiful last year, but summer ducks were scarce. Partridge and squirrels are increasing. Cotton-tail rabbits are so thick that they are destroying orchards and gardens. Muskrats and mink are quite plentiful.

Overseer Robert Bonter, of Marmora, reports that fishing was good in almost all the lakes and rivers, with the exception of yellow bass fishing in Crow Lake, which was not so good as in former years. This was no doubt due to the great increase of mudcats, eels and ling, which are very plentiful on the yellow bass beds and destroy the spawn. He would suggest that some responsible man should be granted a hoop net license to take these destructive fish under the supervision of the Overseer.

Deer are plentiful, also ducks and partridge.

Overseer Thomas Gault, of Deseronto, reports that during the early part of the season the fishing was good. In the fall whitefish were slow in coming up the bay. Bass fishing was very good.

Ducks and partridges are plentiful.

Overseer John Haggerty, of Gilmour, reports a scarcity of mountain trout, which he thinks due to the fact that they are allowed to be taken in October, which is their spawning season. Bass and other fish are plentiful.

Deer are plentiful and partridge scarce. There are not many mink and muskrats, but beaver and otter abound. Bears and wolves are quite numerous.

Overseer James McCaw, of Bancroft, reports that brook trout were plentiful last summer, also grey trout. Bass were more abundant than they had been for some years past.

He is of the opinion that the close season for grey trout should be from October 15th to November 15th, as they nearly all spawn during the last two weeks of October.

Partridge were somewhat scarce. He would suggest that the season be shortened and made from November 1st to 15th. Ducks appeared in few numbers. Deer were quite plentiful this year. Bears were very numerous, quite a few large ones being shot during the summer. Muskrats were scarce, also beaver and otter, none having been seen of late. Some moose were seen in the summer.

Overseer J. A. Moore, of Trenton, reports that there was very little tourist fishing last year in his district, due probably in part to the war and also to the scarcity of game fish. He would recommend that bass fry be deposited in the Bay of Quinte. These waters are natural bass waters, but having been much netted in the past, game fish have become very scarce.

Ducks were not so plentiful last year as usual, and were sought mostly by professional hunters who shoot for the market and sell what they procure from day to day. These men use large flocks of decoys and kill or scare away the ducks as fast as they come. The birds have no chance and other people have no opportunity of securing any. He recommends the total prohibition of the sale of ducks, and that shooting from what are known as monitors, which are nothing but sunken punts, be prohibited. He also considers that the distance that decoys may be placed from the shore should be decreased to sixty yards. If these suggestions were carried out, he thinks it would be very beneficial to the game and to the people who hunt for pleasure.

Partridge have been very scarce and very wild; few have been killed. He would recommend that their open season be shortened, or that there be a close season for two years. Owing to the forest fires these birds are becoming very scarce.

Black squirrels have not been so plentiful as in 1913 and he would urge that they should have a close season for two years. If that cannot be done, the open season should be from October 1st to November 1st.

Overseer J. W. Morton of St. Ola, reports that bass and trout fishing in the lakes in his division during the summer was fairly good. He sold more angling permits than in 1913.

Partridge and ducks are quite plentiful, also deer.

Squirrels, rabbits, beaver, bear and wolves are numerous.

He would recommend that fishing through the ice be prohibited, as it has a tendency to lessen the quantity of salmon trout.

Overseer E. A. Wootton, of Maynooth, reports that speckled trout and salmon trout fishing have been very good.

In some sections deer are reported plentiful but in other parts they are scarce. Wolves have been less numerous during the last few years.

Partridge are very scarce, the bush fires in the spring having done a great deal of damage, and the cold weather resulted in a small hatch. Ducks are scarce, also mink and muskrats, but beaver are plentiful.

Huron County.

Overseer Robert McMurray, of Bayfield, reports that the fishermen had a fairly good season though trout and whitefish were not so plentiful as in 1913. During October there were several bad storms, so that it was impossible to do much fishing. The pound net fishermen report that the catch was not so good as in 1913. Perch were plentiful in the month of October.

Kenora District.

Overseer G. H. Fanning, of Sioux Lookout, reports that at the time of his appointment as overseer in the early part of the year, a great slaughter of big game was going on out of season, principally by foreigners in the employ of the Grand Trunk Pacific Railway Company as section men. Owing to the scarcity of population, his movements were noticed quickly by interested parties and it was not easy to catch the culprits, warning being undoubtedly given by wire at times. From time to time, however, he has succeeded in obtaining evidence two or three weeks after the killing of the game, which has resulted in the conviction of the guilty parties. This seems to make a more lasting impression than catching them in the act, and he has to a very great extent put a stop to the killing of game out of season. The fines imposed by Magistrate Vaughan in cases brought up by him amounted to about $825 and costs.

Ducks and partridge are very scarce and few have been killed. Big game is very plentiful.

Overseer W. G. Muncer, of Minaki, reports that the past season for angling was one of the best ever known at Minaki, Fox Lake, Red Deer Lake and Vermillion Lake, which are trout waters.

Maskinonge fishing was excellent, very fine fish having been caught, one turning the scale at thirty-three pounds. Pickerel, he has never seen finer. Trout fishing was good on Red Deer Lake, and some very large fish were caught. Fish of all kinds appear to be plentiful.

He regrets to say that the Game and Fishery Laws were not well observed by the non-residents, and as a result he had to lay a number of charges. Several complaints were received from non-residents, regarding the illegal practice of angling without a license, and the buying and selling of game during the close season. Several convictions were made for such offences.

Many thousands of visitors stayed at Minaki Inn. The management informed him that as many as one thousand have sat down to dinner at one time.

Moose and caribou are very plentiful throughout the district. Red deer appear to be more plentiful than ever. Partridge are plentiful. Ducks very scarce.

Muskrats and mink are quite up to the average.

Wolves are becoming very numerous, both brush and timber.

Fish and game notices were posted throughout the district, but in many places have been wilfully pulled down, especially round Minaki railway station.

Local hunters appreciated the extension of the open season for big game and many more hunted as the weather became more favourable.

In conclusion he would suggest that every person who has a gun, resident or non-resident, should be licensed to carry such gun. Shot guns and 22 calibre rifles are to be found in almost every locality during the close season.

Kent County.

Overseer John Crotty, of Bothwell, reports there was a decrease in the number of fish caught owing to the water being high in the river late in the season. Another reason may be found in the fact that the farmers are using nets for domestic purposes and local consumption only, not being allowed to export any, and that, therefore, the regular fishermen have given up the business.

Game birds are becoming scarce and consist of only a few partridge and woodcock and some scattered bevies of quail, to which the protection of this year will be beneficial.

Muskrats are the only fur-bearing animals in this district, and there are only a few of them.

Overseer John Featherston, of Renwick, reports that fishing during the last year on the whole was not up to the average, either for tugs with gill nets or for pound nets. The catch of whitefish was good and some excellent fish of a very large size were taken especially in the vicinity of Wheatley. The catch of blue pickerel was very large, probably double the number of pounds taken any year before. Herring fishing has fallen off very much. He has consulted several of the oldest and most experienced fishermen but they seem to be unable to give any reason for the decrease. Some say it is just an off year and in all probability the catch next season will be well up to the average. All other less important varieties of fish seem to be well up to the usual standard and of good quality.

Game is slightly on the increase. The Hungarian partridge sent to him by the Department in furtherance of an effort to stock his territory are doing well and have increased in number. He thinks they are well adapted to the Country.

Quail and squirrels are also more numerous than they have been for years.

Overseer Richard Little, of Wallaceburg, reports that angling for bass was excellent and other game fish were fairly plentiful. Commercial fishing was as good, if not better than in 1913, especially for carp. The latter fish is in great demand among the Hebrews and the market for it is growing rapidly, between seven and eight hundred boxes of carp having been shipped from Mitchell's Bay to Toronto besides quite a large quantity shipped to Montreal during last year.

Marsh and lake ducks were very plentiful. He would strongly recommend that the season for ducks and other water fowl such as snipe, rail, plover and all other birds known as shore birds, should open on the first day of October instead of the fifteenth day of September as at present.

He would also recommend that the Game Law be so amended that the shooting of ducks more than two hundred yards from shore line be prohibited. Some hunters in his district go out into the open water in small boats and stir up and shoot into large flocks of ducks. Such flocks are thus scattered and driven off their feeding grounds with little benefit to the shooter who merely puts them in flight and drives them away from their usual haunts.

Overseer James McVittie, of Blenheim, reports that the fall season for 1913 was good, large catches of herring being reported but not many whitefish, though as those waters are not considered whitefish grounds they do not look for many. Carp fishing was light.

The spring fishing for 1914 was poor and the summer fishing light. The run of herring that the fishermen usually get did not come at all. The prices were

good all the summer, and this helped out the fishermen. A heavy wind which came on about October 13th and lasted a week put most of the fishermen out of business, as they lost a great many stakes and some twine, that will cost a good deal to replace. Blue pike lasted all the summer. The licenses were all paid early and the laws well observed. No seizures of any kind were made.

Ducks were plentiful during the fall of 1913 but hard to shoot, while this fall they have been scarce up to the present. The weather is warm and it is not likely many will come till it becomes colder. Deer in Rondeau Park are still very plentiful.

No fines have been imposed and no fisheries have changed hands this fall.

Overseer A. H. Patterson, of Bothwell, reports that not many fish were caught in his district last year and none were exported. The farmers were the only people who fished and they did so for domestic purposes only.

Quail and partridges are scarce; woodcock are nearly extinct.

Overseer George Peltier, of Paincourt, reports that the number of fish caught by licensed fishermen on Lake St. Clair last year was greater than the previous year. This was on account of a very early spring; the fishermen having their nets in the water two weeks earlier than the year before and being able to procure better catches.

The roll nets in the River Thames used by the farmers have proved satisfactory, sufficient fish being taken for the farmers' own use; no part of the catch was sold to his knowledge.

Ducks were plentiful last year, but quail and other game were very scarce and the restriction now imposed should be continued. Mink are very scarce, but muskrats are holding their own.

Lambton County.

Overseer H. A. Blunden, of Sarnia, reports that the fishing season opened at about the usual time, but most of the fishermen were rather late in setting their nets owing to the loss of their material in the November storm of 1913.

The fishermen have reported that the fishing has been uncertain this season, some grounds having given large catches for a few days, while others gave poor results.

Game was fairly plentiful last season, but there were very few wild geese. He did not issue many deer hunting licenses last season, probably owing to the fact that money was not so plentiful and people were not able to afford the pleasure.

Lanark County.

Overseer Ephraim Deacon, of Bolingbroke, reports that the game laws have been well observed in his district.

Game fish were about the same as the year before.

About the usual number of tourists visited the lakes last summer, and reported good catches.

Red deer are quite numerous round Bolingbroke, but partridge are not so plentiful as in 1913. Ducks are also scarce.

Muskrats are about the same as in former years, but mink are very scarce.

Oveseer William Pepper, of Lanark, reports that the Mississippi River and tributary streams are fast becoming well stocked with pickerel. Bass do not seem to decrease in quantity or size, but pike are not nearly so plentiful as they have been in the past.

Ducks, partridge and other game birds seem to be plentiful, although the number taken last year was not so large as formerly.

Deer appear to be about as numerous as in past years. In spite of the number killed by hunters, the supply seems to remain about the same.

Overseer Burke, of Perth, reports that bass, pickerel and pike are plentiful in the Tay River. Bass fishing was very good in Otty Lake last season.

Partridge have not been so thick for years, and ducks are very plentiful. He is of the opinion that there should be a regulation prohibiting persons from going to grounds frequented by ducks to shoot blackbirds before the season opens. This gives the Overseer a great deal of trouble, and the ducks are frightened away and do not return. Muskrat and mink are plentiful, also deer.

Overseer J. H. Phillips, of Smith's Falls, reports that fishing on the Rideau this summer was good. Early in the season salmon fishing was good, and late in the summer bass fishing was excellent. He thinks it would be a good thing if a limit were put on the number of salmon caught each day by one person.

Though there were not many tourists from the United States last season, the Rideau was crowded by residents of the Province.

Black ducks were very plentiful. Wood ducks are becoming rarer. Partridge are plentiful this year.

Overseer Fred. Stanzel, of Carleton Place, reports that fishing was fairly good; rough fish, bass and pickerel being quite plentiful.

Ducks were not so plentiful last season as the former one. Partridge have increased wonderfully, judging from the number which have been shot during the open season.

Muskrats are about the same as previous years. Mink still remain very scarce.

Overseer Hugh Wilson, of Elphin, reports that deer are becoming more numerous each year.

Partridge are not so plentiful as last year, and ducks are very scarce.

Leeds County.

Overseer W. J. Birch, of Delta, reports that the past season in his locality was an ideal one as far as the weather and fishing were concerned, both being excellent, but there were not so many tourists and pleasure-seekers as usual, possibly on account of the war.

Ducks were not quite so plentiful, but partridge had increased wonderfully.

He would recommend a gun license and a trapper's license, even if the fee were small.

Muskrats are numerous, but there are no mink. Black squirrels are plentiful, and he would advise that the open season commence one month earlier.

Overseer Gordon Clark, of Westport, reports that the fishing during 1914 was fairly good. He sold more permits than usual. The laws were well observed.

Muskrats seem to be plentiful, but mink are very scarce. Partridge have been very scarce on account of their being hunted too closely. He thinks they should have a close season for a few years. Ducks are very scarce. Deer are quite plentiful this year.

Overseer H. N. Covell, of Lombardy, reports that the fishing on the lakes has been very good. He thinks it is a good thing that the open season for salmon has been shortened.

No illegal fishing has come to his notice.

Partridge, wild duck and muskrats are very plentiful this year, but mink are very scarce.

Overseer John Fleming, of Newboro, reports that in the discharge of his duties as Master of patrol boat *Navarch* he patrolled the waters of Lake Ontario, Weller's Bay, Bay of Quinte, River St. Lawrence, Rideau and Ottawa Rivers.

He found the bass fishing better than in previous years, especially in the waters in which hoop nets are being operated. He has been frequently informed by the residents of such sections, and also by tourists, that the angling was never so good as it was this year.

The catch of muskrats in his district was about the average. He would recommend that the open season for trapping be confined to the months of March and April, as that would do away with the practice of setting traps in the banks and houses. Partridge are not very plentiful, and mink are very scarce. Wild ducks are about the same as former years, not very plentiful.

The fish and game laws are fairly well observed, except in the Ottawa River. He would suggest that a good man, who could devote most of his time to the service, be appointed for the Ottawa River, fronting the Counties of Russell and Prescott.

Overseer John McGuire, of Jones' Falls, reports that last season was a very successful one, while a little behind financially, the fishing was very good. He did not sell so many angling permits on account of the boarding-houses and hotels being filled with more residents of the Province than usual.

He is of the opinion that it would be in the interest of the fisheries to limit the catch of salmon to four each day, as formerly. If this is not done, there will very soon be no salmon in the waters of the Rideau or any other waters in the eastern part of Ontario. He also thinks that the catch of bass should be limited to five instead of eight. He has been talking this over with the tourists and they are, on the whole, in favor of this suggestion. He is satisfied that there would be just as many tourists, and it would save the bass.

He further advises that winter trapping and killing of muskrats be prohibited. It is impossible to prevent the houses being cut open in the winter, as it is the only way to get the rats, and the trappers will do it every time. If the open season were from March 15th to May 1st it would be a great improvement. The honest trapper is in favor of this, as it would save the rats.

Overseer J. H. Stewart, of Brockville, reports that the fishing season was very good, principally for black bass, pickerel, pike and maskinonge, in the St. Lawrence River.

Ducks were more plentiful last spring and this fall than they have been for years, and only one conviction for illegal duck shooting was made.

Partridge are very plentiful this fall.

Overseer William Spence, of Charleston, reports that he kept a close watch over Wiltse and Charleston Lakes during the past season and found the game and fish laws well observed. The season was a very successful one.

More tourists visited the lake last summer than in 1913, and found the fishing better than it has been for a great many years.

Ducks were plentiful on Charleston and Wiltse Lakes. Partridges are increasing. Mink, black squirrels and muskrats are scarce.

Overseer George Slate, of Rockport, reports that black bass were plentiful during the latter part of the season. Pickerel and maskinonge were more plentiful than in 1913.

Black squirrels are scarce. Ducks are quite plentiful. Partridge are scarce.

Overseer George Toner, of Gananoque, reports that there were fewer tourists on the river last year than usual. Fishing was exceptionally good. Bass were very plentiful, and between thirty and forty maskinonge were caught within two miles of Gananoque.

Partridge, snipe and plover are more plentiful, also black and grey squirrels. Ducks are plentiful.

Mink seem to be scarce. Cottontail rabbits are becoming a nuisance and destroying fruit trees, shrubs and other trees on the islands.

Muskrats are more plentiful. owing no doubt to the reduction in the trapping season, and he would recommend that the open season be from March 1st to May 1st, and that a small fee be charged for a trapper's license.

There were more night lines and nets taken last year, owing to his having the small skiff motor boat, which enabled him to cover a great deal more ground in the time.

Overseer James Townsend, of Lyndhurst, reports that game and fish were fairly plentiful. A few excellent game fish were caught. Fewer permits were sold, as there were not so many Americans visiting the waters as in former years.

Hunters have reported some very fine shooting; one morning three hunters bagged sixty-seven black ducks. Partridge are plentiful. Muskrats are a little scarce, he would advise shortening the open season to March and April, and that trappers should pay the small fee of $2 for a license. He would also recommend a gun license.

Overseer J. R. Wight, of Newboro, reports that he has patrolled his territory very carefully, and found the law well observed.

There is no doubt but that the close season has accomplished much on the Rideau waters and smaller lakes. The fishermen all report good catches. He thinks that the allowance for a day's catch of bass is still too large, and that it should be reduced to six instead of eight. There have not been so many American tourists as usual. He finds that most of the anglers come from Ottawa and other Canadian towns and cities.

Ducks and partridge are about as numerous this year as last. Foxes were very scarce, but mink and muskrats showed no diminution.

Very few complaints of infractions of the Act reached him last year, and those that did come to his notice did not result in convictions, as there was not sufficient evidence.

Lennox County.

Overseer P. W. Dafoe, of Napanee, reports that commercial fishing was a success last year. The prices having been high and the catch good, there has therefore been little grumbling from the fishermen. He believes that more bass and maskinonge were taken last season than usual, and the Bay and Napanee River were visited during the summer by great sturgeon six feet in length.

Partridge are certainly becoming more plentiful everywhere. Ducks seem to hold their own. Black squirrels are quite numerous. Muskrats are none too plentiful this fall, and there are not many mink about.

In the northern highlands deer were plentiful, and a great many hunters went out after them. There was not so much illegal hunting in the north as reported, but too much was undoubtedly done.

Overseer G. H. Gurren, of Sandhurst, reports that commercial fishing was not up to the average during the beginning of the season, but improved towards the close. Whitefish were very scarce in the bay all the season. Eel fishing was very good throughout the year, but on account of the extreme dry weather during July and August a good many fishermen ran out of bait. He would recommend the granting of a few licenses for eel fishing with eel-pots (which are similar to those in use on the Atlantic) as an experiment.

A few fishermen showed some inclination to break the law, but the prosecution of one seemed to hold the rest in line.

The patrol boat *Navarch,* with Capt. Fleming in charge, was of great value in enforcing the regulations.

Anglers were very numerous, and all reported good fishing. It is the custom of a good many American yachts to run over to the Brothers and elsewhere, and letting down their skiffs they fish for bass. As soon as they see (through their glasses) the patrol boat coming they make off.

Black squirrels are very scarce, in fact nearly extinct. Grey squirrels and foxes are on the increase. Muskrats were not so plentiful as usual. Ducks were very scarce last season.

Overseer E. M. Huffman, of Hay Bay, reports the catch of fish was not so large as usual, owing to water conditions.

There were fewer tourists this season, but several nice catches of maskinonge were reported by local anglers.

Ducks were plentiful and hunters had good shooting.

He thinks that the shooting of black squirrels should be prohibited, as it is a rare thing and a treat to see one.

He would advocate shorter season for muskrats, and that trappers should be licensed.

Lincoln County.

Overseer James May, of St. Catharines, reports that some fine catches of herring were made during the summer months, and on the whole the fishermen were well satisfied with the season's fishing.

Game is very scarce, except for a few pheasants. He recommends that there be a close season for muskrats for a period of at least three years.

Overseer Oliver Taylor, of Niagara-on-the-Lake, reports that herring fishing has been better than last year. Whitefish are also more plentiful, small whitefish

particularly being very plentiful. There are a great many small pickerel. The fishermen are of the opinion that the prospects for next season's fishing of whitefish and pickerel are good.

Fishing with the machine nets at Queenston has been very poor this season, with the exception of two or three days, when it was very good, herring forming the principal part of the catch. Angling in the river has been very poor.

The principal game in this district are pheasants, which were quite numerous before the open season, but now the cock birds are very scarce.

Muskrats were fairly plentiful in the ponds last spring.

Manitoulin District.

Overseer J. J. Avis, of Cockburn Island, reports that the past season has been a good one for commercial fishing. The only complaint made was the shortage of trout spawn, and the need of a hatchery in the district.

Deer, partridge, ducks and rabbits are on the increase. Fur-bearing animals are very scarce.

Overseer W. M. Boyd, of Kagawong, reports that the last was an exceptional season. There were not quite so many tourists as usual, but the fishing in Kagawong Lake was splendid, some of the finest specimens of bass that were ever caught in that district, being taken. He does not think that Kagawong Lake has any rival. Anglers who have fished at all the good fishing grounds in Michigan and Wisconsin say that nothing approaches the number of large fish caught at Kagawong last year. He thinks this is largely due to the fact that the fish have now recovered from the illegal trap net fishing that was carried on in this lake some time ago, and myriads of fine large fish may be taken at the present time.

Partridge are not quite so plentiful, the broods seem to be smaller than usual.

Mink are perhaps a little more plentiful and muskrats are improving. Otter are appearing again, they have been almost a thing of the past, but are showing up in Kagawong Lake at a few points.

Red deer were very numerous last season. He had never heard of so many on the island. He thinks that the license laws should be made so that no one could shoot a deer on any pretence without paying a fee for a license. He heard on the very highest authority of one farmer who had shot seven deer on the west end of the island. He is of the opinion that if the fee were changed to $1 and allow the hunter one deer, or $2 and two deer, it would be a good thing, and make the farmer's son pay as well as the farmer and everyone else who went hunting. This would make it easier to see that the law was being properly observed.

Overseer Andrew Hall, of Gore Bay, reports that brook trout were not so plentiful as usual and he wishes to call attention to the fact that mill owners do not build proper slides in their dams.

Bass have been very plentiful. According to reports, commercial fishing has been better than last year.

Partridge are fairly plentiful and ducks about the same as usual.

Fur-bearing animals are, according to reports, rather scarce.

Overseer David Irwin, of Little Current, reports that last year commercial fishing was much better than for many years past.

Black bass and other game fish were very plentiful, but there do not appear to have been so many caught as in 1913 as the bass did not bite so well, according to reports.

A large number of tourists visited the district, and the game and fishery laws were well observed.

Ducks and partridge are reported to be fairly plentiful.

Moose and deer are quite plentiful, particularly red deer.

Overseer J. W. Lewis, of Sheguiandah, reports that commercial fishing was much better last year than in 1913 at all the fishing stations he has visited. He has had more trouble at Killarney than at any other part of his territory owing to a few so-called gill net fishermen who use their gill net license as a blind to fish seines. It is almost impossible to catch them in the act of fishing their seines, as they have spies watching the overseers all the time. He would recommend that this class of fishermen do not receive licenses then they could not sell their fish and would have to give up the business.

There were about the average number of tourists and bass fishing was fairly good.

Deer were plentiful last year and moose about the same as usual. Partridge are becoming more scarce every year but ducks keep plentiful.

He suggests that all camp help be licensed in the same manner as guides, as often guides claim that they are only camp helpers when they are really acting as both.

Overseer John McArthur, of Ice Lake, reports that the fishing was about the same as usual, pike and bass being quite plentiful.

Ducks and partridge have been fairly plentiful. Large numbers were shot during the beginning of the season. He is of the opinion that the bag limit was strictly observed.

Rabbits are numerous. Red deer are becoming more plentiful every year in spite of the numbers killed during the season. Muskrats are quite plentiful. Mink are rather scarce.

Overseer David Pyette, of Tehkummah, reports that speckled trout are very scarce. Bass fishing is good.

Partridge are very scarce. If they are not given a close season in his district for at least two years, they will soon be a thing of the past.

Deer were reported plentiful.

Overseer James Ramesbottom, of Little Current, reports that the fish in his district are mainly black bass, pickerel, pike, whitefish and trout.

Black bass are more plentiful in some places and less in others. He believes it is a mistake for an angler to throw back fish under ten inches in length. For some reason a small bass takes the hook further down his throat than a large bass, and in taking them off the hook 80 per cent. of them are killed or injured so that they will die.

With regard to marketable fish, they seem to be holding their own. Pickerel are increasing, which the fishermen say is due to so many suckers being fished out in the winter.

The game in this district consist of moose, red deer, ducks and partridge, and the fur-bearing animals: mink, marten, beaver, otter and foxes.

Moose and red deer are as plentiful as ever, but if the hunting season were to open two weeks later it would help to increase them, as there is seldom any snow during the first two weeks in November, but there usually is some during the last two weeks. A great many deer are wounded, but through there not being any snow it is impossible to track them and they get away and die.

Ducks are scarce in this district, but this can be attributed to the lack of feeding grounds. Partridge are less plentiful this year than last, probably because of the wet, cold weather during the hatching season. The Overseer is of the opinion that the number allowed each sportsman is too great.

Fur-bearing animals are rather scarce and are not likely to increase on account of the country becoming more thickly populated every day. The licensing of the fur dealers he considers a wise step, and he thinks it would be a good idea if the trappers were licensed, even if the fee were only 25c. each, as he often meets men in the woods with guns who claim to be trappers.

Middlesex County.

Overseer William Boler, of Byron, reports that a Game Protective Association was formed last November in his district. There are seventy members living in the Townships of Westminster, Delaware, and London, whose aim it is to encourage the protection of game of all kinds.

Partridges are rarer than ever, also quail. Black squirrels and cotton-tail rabbits are increasing. Wild geese and ducks are about the same as usual. He suggests that people who live in towns and come out to the country to shoot should be obliged to take out a license for which the fee might be $2 per annum. This would help to protect the game.

Overseer W. E. Collins, of Strathroy, reports that fishing was good in his district last year. Pike and pickerel were fine.

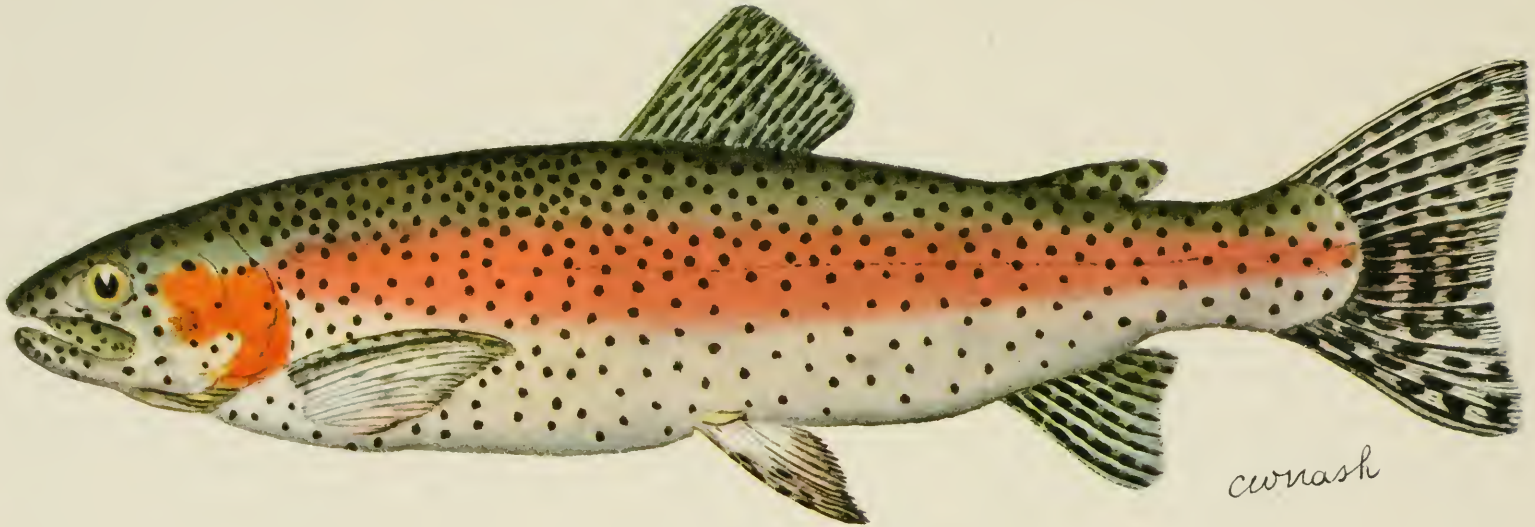
Rabbits and black and grey squirrels are quite plentiful. There are not many quail in his division. During September there were a few partridge. Muskrats are quite plentiful. Mink, raccoon and fox are scarce.

Overseer Arthur Corsant, of Masonville, reports that angling was very fair for a part of the season, but on August 12th there was a slaughter of fish for many miles west of the City of London. He does not think there was one fish left alive in the river for twelve miles west of London. The water seemed to be polluted with some strong drug or acid, for it turned a black colour. The trouble might arise from a number of sources, one of which is the sewer from the city which empties into the river.

Game is very scarce in this district. Black squirrels are slightly on the increase, but mink and muskrats are very scarce. He is of the opinion that squirrels, quail and partridge should have a close season for three years, which would greatly increase the numbers.

Overseer J. M. Temple, of Dorchester, reports that game fish are scarce in his district as none come up the river. All there are, are bred in the river east of London on account of the fish slides not being in proper order. There being no fishway in the Hout Dam in the City of London, the fish cannot ascend the river. All other fish are scarce.

Game is quite scarce. There are a few ruffed grouse or native partridges. Quail is almost a bird of the past, and ducks are very scarce. There are very



RAINBOW TROUT—*Introduced*
(*Salmo irideus*)
SPECIMEN FROM SAULT STE. MARIE

few woodcock. Wood hares are plentiful, but there are no black squirrels. There are a few muskrats, while mink are very scarce. There are no beaver or otter.

The overseer recommends that every persons who wishes to carry a gun be obliged to take out a license.

Muskoka District.

Overseer F. A. Hanes, of Huntsville, reports that when going through the different parts of the country and inspecting the different lakes, he took the opportunity to find out how the bass were doing. They appeared to be increasing very fast in some waters, while speckled trout were found in nearly all the creeks and lakes some weighing from 3½ to 4 lbs. Salmon trout or lake trout were more plentiful than they had been for some years.

Partridge were increasing in some parts, but owing to the bush fires they were scarce in places. He found beaver in all the lakes and creeks, but muskrats are becoming more scarce each year. There seemed to be plenty of mink, and deer were more plentiful last season than they had been for years. He would recommend that otter be taken, for they destroy the fish in small lakes and trout streams.

Overseer E. W. Lockman, of Dorset, reports that the majority of lakes in his division contain principally salmon and speckled trout; a few contain bass as well.

Hollow Lake provides the best salmon fishing and the adjacent small lakes reasonable quantities of speckled trout. In none of the lakes in his division is it possible to take more fish in a day than is allowed by law, except perhaps in the early spring.

With regard to game, there are deer, partridge, a few ducks and many beaver. From recent observation, he does not think the deer are as plentiful this year as last. Partridge are also scarce.

Overseer William Robinson, of Kilworthy, reports that the law has been fairly well observed in his district. The tourists had a good season and he sold more angling permits than the previous year.

Deer are increasing also beaver and otter, which may be found in almost every stream in his territory. Partridge are more scarce than usual, but ducks were fairly numerous. Muskrats are plentiful and mink are about the same as last year.

Overseer William Smith, of Gravenhurst, reports that he patrolled the Muskoka Lakes for five months—from May 15th to October 15th, and has found very little violation of the Fisheries Act. The close season was well observed as the tourists and settlers are realizing the advantage of aiding the Department in their efforts to keep the lakes stocked with game fish.

There were not so many anglers as usual this season. August, usually the best month of the season, was very wet, and consequently unpleasant for angling. Notwithstanding this, he sold about the average number of permits, while a great many sold at the border came to his notice.

The fishing compared favourably with other years, although some people say the contrary, but this adverse opinion he attributes to the fact that the fish are not so anxious to bite as formerly as the waters are well stocked.

Beaver are becoming very plentiful, while muskrats and mink showed no decrease. There are not many deer in this district, partridge were about the same as the previous year.

There were four violations of the Game and Fisheries Act, and fines were imposed in every case.

Overseer John Traves, of Fraserburg, reports that fishing was fairly good on the whole, and in some lakes very good. Angling for bass in the south branch of the Muskoka River was good, there are always plenty of fish in the water.

Deer are increasing and partridge are more plentiful than two years ago. Most of the hunters procured the full number of deer allowed, some of them doing so in the first week. Ducks also were numerous last fall and rabbits show no decrease. In the four townships comprising his territory the overseer finds beaver are very plentiful in the different creeks and marshes, and are flooding quite a lot of land, but no complaints have come to his notice. Otter also are increasing. Muskrats are very plentiful. During his travels through the woods last summer he saw quite a number of young partridge, also some deer and fawns.

Nipissing District.

Overseer Richard Conway, of Madawaska, reports that in the streams black bass and brook trout may be found, and the lakes round Madawaska and between that place and Petawawa contain salmon and grey trout and ling. There are no pike, pickerel or maskinonge west of High Falls.

Deer and partridge are very scarce. In his opinion there should be a close season for four years so that what little game there is will not be exterminated. The fires in the spring destroyed most of the partridge and fourteen carcasses of deer were found after the fires were put out.

Overseer Joseph Rivet, of Sturgeon Falls, reports that the fishing was far better than in previous years.

There was no illegal fishing in Lake Nipissing or its tributaries, and the Game and Fishery Laws were well observed to the best of his knowledge.

Norfolk County.

Overseer J. S. Smith, of Port Rowan, reports that the fishing in both the inner and outer bays was up to the average.

The demand for angling permits was about the same as usual. Bass fishing has been very good.

Ducks do not seem to be so plentiful as in former years, possibly owing to the mild weather.

Black squirrels are very numerous.

Northumberland County.

Overseer C. H. Cassan, of Campbellford, reports that fishing was very good last year except during the month of August. He is of the opinion that the dredging and blasting that has been carried on in the Trent Valley Canal has injured the fishing and he would recommend that the waters be stocked with bass, as fishing for this species of fish has not been so good.

Muskrats are quite plentiful but mink are scarce. Ducks were very numerous. Cotton-tail rabbits are becoming very thick in some parts and doing damage.

Overseer Thomas H. Cheer, of Brighton, reports that the catch of trout and whitefish was very good last season. The coarser varieties of fish were extra good, especially pike, which were much better than in 1913.

Ducks were scarce up to late in the fall but became more plentiful as the season passed. He attributes this to the fact that the fall was very warm and the ducks were late in leaving the north. Partridge are slightly on the increase, but are quite scarce yet. Black and grey squirrels are very scarce, especially the latter. He would like to see them given a close season for two or three years to see if that would help them. Muskrats are very scarce. He thinks if the open season were from the 15th March to the 30th April, it would stop the destruction of their dens and houses and it would be better for trade. Mink are becoming almost extinct. He would like to see the open season shortened. Deer are reported to be fairly plentiful this season and he is of the opinion that they will remain so as long as one man is allowed to shoot only one deer.

Overseer J. H. Hess, of Hastings, reports that as far as the fish are concerned the fishing was good last season and the quality above the average of other years.

There was a large number of ducks last fall, and he does not think there was any shooting out of season carried on. Partridge are more numerous than other years.

Overseer H. W. Hayes, of Trenton, reports that last fall the fishermen caught more herring than during any previous season in their recollection.

Ducks were very numerous last fall. Inshore ducks, such as teal and black ducks, were not so plentiful as usual, but deep water ducks were on the increase.

Overseer W. H. Johnson, of Harwood, reports that the Game and Fishery Laws were fairly well observed in his district, although there was some illegal shooting carried on in Rice Lake before sunrise and after sunset, which he did his best to stop.

Maskinonge fishing has not been so good as last year. Bass fishing was very good. This has been an exceptional year for the protection of spawn and little fish, as the water in the lake was very low and remained about the same until the fish were hatched and out in deep water. He suggests that fishing from gasolene boats be prohibited.

Duck shooting in 1914 was not so good as the previous seasons. Partridge are scarce. Mink are scarce, also black and grey squirrels. Rabbits are quite plentiful. Trapping was good in the spring. He suggests that the open season for trapping be from March 15th to April 25th.

A greater number of Americans and tourists visited Rice Lake in the vicinity of Harwood than during any previous year.

Overseer A. J. Kent, of Bewdley, reports that maskinonge and bass were plentiful in the creeks and marshes last spring, the low water being an advantage as the spawn came to maturity. In a few years there should be a large increase in the fish.

The close season for fish was very well observed, though no doubt a certain number of fish were killed in the spring by persons who fail to appreciate the harm they do.

When the season opened on the 16th June they had high winds to contend with, and the consequence was there were not so many maskinonge landed as in the previous year, but bass fishing was good. The number of tourists who visit the district is increasing.

A fair number of muskrats were trapped last spring. The low water made trapping somewhat difficult, but it spared the muskrats and they should be numerous next spring.

Black ducks seemed to be scarce last season, compared with other seasons, but fall ducks were plentiful. Partridge were fairly plentiful and black squirrels numerous.

Overseer J. R. McAllister, of Gore's Landing, reports that maskinonge fishing was not very good until the latter part of the season. During the end of September and in October there were a great many large maskinonge taken. There were some very fine catches of small mouthed black bass in September and October.

Ducks were very plentiful in May when they were on their way north, and large numbers returned in the fall going south. Muskrats are very plentiful in every marsh that he has seen and they have built some large houses. Grouse are more plentiful than usual in his division. Squirrels, both black and grey, are as numerous as other years.

There have not been so many tourists at Gore's Landing as usual.

Overseer F. H. Meneilly, of Warkworth, reports that the fishing in his district is improving each year since nets have been abolished. Where a year ago mudcats were never caught, numbers were caught last year. Maskinonge were not caught so plentifully as other years. This he attributes to the blasting on the end of the Trent Canal, but as this work is nearly finished, he looks for better returns of this species of fish in the future. Other fish show little change.

All the fish caught in his division are used locally.

Good fishways have been installed in all the new dams.

The close seasons have been well observed, but as some of them overlap, it is possible for anyone to easily evade them by taking black squirrels when out to shoot partridge.

Overseer D. C. Stuart, of Codrington, reports that the law has been very well observed in his district this year. He had some trouble with mill refuse which was being allowed to run in the creeks, but having notified parties responsible to make some other disposition of it, the nuisance has been stopped.

There seems to be plenty of fish of all kinds, as people appear to be satisfied with their catches.

There were not so many ducks as usual, but partridge and black squirrels are plentiful. Mink are scarce, while muskrats are numerous. Cotton-tail rabbits are very numerous and doing damage to the farms.

Overseer Amos Shearer, of Roseneath, reports that the Fish and Game Laws were not violated to any extent in his division of Rice Lake and that he had no occasion to prosecute anyone for violations of the Act.

Duck shooting was not up to the average, although there seemed to be a large number of ducks. Partridge and black squirrels were quite plentiful. Mink are about exterminated. Muskrats show no sign of decreasing.

Overseer W. H. Thompson, of Bailieboro, reports that maskinonge fishing was poor in the beginning of the season, but was good in October, though there were very few people fishing during that month. Black bass have been scarce in the river.

Black ducks have been about the same as in 1913 and hard to get. Wood ducks were a little more plentiful.

Trapping last spring was very poor, owing to very low water, therefore, there are more muskrats this fall than usual. Mink are a thing of the past.

Partridge hold their own but black and grey squirrels are very scarce. He thinks that Overseers on the lake and river should meet at least once a year and talk things over. This would stimulate them and give them a greater interest in their work with regard to the protection of the game and fish.

Ontario County.

Overseer Gilbert Gillespie, of Brechin, reports that the winter fishing was very good. Bass are scarce, but trout were plentiful in May and June. There were some good reports of trout in October and some fine catches were made.

Ducks are not plentiful on that side of the lake. Partridge are increasing. Muskrats are plentiful and there are a few mink to be seen.

Overseer Charles Halward, of Cannington, reports that the past year was a favourable one for most kinds of game. Ducks were rather scarce on account of the swamps, where they generally feed, becoming dried up during the hot weather. Other game were about the same as usual.

Fish have not increased much in the river, but with the protection now given them they will probably be more plentiful in the near future and afford better fishing.

Overseer George Hood, of Scugog, reports that maskinonge were very scarce in his district, though on the east side there was a good catch. Bass are steadily increasing and a number were caught. Small fish are very plentiful.

Mink are increasing and muskrats and rabbits are very plentiful. There are a great many black ducks and the shooting around the lake has been good. Blue bills are plentiful. Geese were very numerous last spring, and partridge are on the increase.

Overseer Donald McPhee, of Uptergrove, reports that in Lake Simcoe, trout, maskinonge, whitefish and carp are increasing rapidly. Black bass are small and not plentiful.

Ducks, partridges and muskrats are increasing but mink are scarce.

In Mud Lake maskinonge, pickerel and bass are all increasing.

Partridge, ducks and muskrats are plentiful, but mink are scarce.

Overseer H. McDonald, of Beaverton, reports that bass fishing was good last season, and all the anglers were satisfied with their catches. Trolling for salmon trout was also good, especially in the spring. Bass, salmon trout and whitefish are increasing in Lake Simcoe. He is of the opinion that the close season for salmon trout should commence on the 10th of October.

Game in this district seem to be about the same as usual. Ducks visit the vicinity of the lake in large numbers at present, but do not stay long as there is not much feed for them now that the carp have destroyed it. Partridge seem to be as plentiful as usual. Mink and muskrats are more scarce if anything. Little trapping or hunting has been done during the last year or so.

Overseer Thomas Mansfield, of Pickering, reports that last year was no improvement on the previous years either with regard to fish or game in fact it was not quite so good as the year before.

Less fish was taken than formerly, but he accounts for this by pointing out that the wages paid in other occupations are so much higher that the fishermen have given up fishing in consequence. Now one man attempts to do the work of two, but it is difficult for him to locate or keep track of the fish running in and out.

Ducks were very fair for a little over a week, but the flight was short.

The law has been fairly well observed in his district.

Overseer Michael Timlin, of Atherley, reports that the fishing was very good during the past year. Herring, maskinonge, bass and pickerel are the chief fish caught in his district.

Hares, squirrels and other small game are quite numerous. There is a marked increase in partridge, and ducks are also more plentiful. Mink are scarce and muskrats abundant.

Parry Sound District.

Overseer John Dunk, of Kearney, is pleased to report that owing in a large degree to the splendid winter, free from snow crust, during 1913-14, there are evidences of a large increase in deer.

Partridge have decreased. This he attributes to the bush fires during May, June and a part of July. He noticed that second hatchings had taken place, as many small and young partridges are to be seen.

Mink and muskrats are very scarce.

Beaver still continue to increase. Almost every small creek has its colony. On Lynx Lake close to his home beavers could be observed any afternoon in the fall storing their winter food.

Overseer John Duncan, of Callander, reports the usual number of farmers from the south end of Himsworth came to get some fish in February and March, and all whom he came across were well pleased with their catches, although he did not think much of them, not having seen anyone with a larger fish than a four pound pike. In April the ice became so wet that as far as he could see no fishing was done. He was on the shore every day. In May there were the usual number of unemployed fishing at the wharves, he did not see any pickerel caught up to the 20th May, after which time it was easy for anyone to catch the legal number in an hour. He had no trouble with anyone exceeding the limit.

There were quite a number of bass spawning round the shore near the wharf. He watched a good many times to see if they were likely to be frightened away, and pointed them out to a number of acquaintances who are interested in nature and they as well as himself were surprised at the indifference of the bass to any kind of bait and the way they would fight off any other fish that would come near them.

The pike taken during the season were extra large and the few bass that he saw caught were large. None of the bass anglers was able to catch the full number allowed any one fisherman in one day. This must have been owing to the large number of shad flies and schools of herring which were around all the season.

On March 16th he saw a flock of wild geese going north and the call of the killdeer was heard all round about that time.

Partridge are very scarce. There are a good many signs of deer. He saw quite a colony of beaver in the next township in September. Muskrats are very plentiful in the creeks. Rabbits are coming around again in the unburned sections of his district. Ducks were scarce; also golden legged plover. There were numbers of snipe. The black birds (grackles) were not nearly so numerous last season as they were the preceding one and left earlier.

There were some large bush fires and he thinks that this was why there were not so many deer about.

Overseer John Floyd, of Nipissing, reports that in his district there are pike in large quantities and pickerel in considerable numbers, but black bass are not so numerous as in former years. Large mouthed bass and herring are very numerous in the small lakes, but very little fishing is done on these lakes. Whitefish are scarce, also maskinonge. As there is no sturgeon fishing it is hard to report on them, but they appear to be scarce. Brook trout are very scarce and there are hardly any lake trout. Suckers are very numerous.

Red deer are fairly numerous in certain localities and there are very few moose.

Beaver are beginning to build colonies on small lakes, and there are a few otter. Fisher and marten are very scarce. Mink are to be had in considerable numbers, and in some of the marshes muskrats are very plentiful, though great quantities have been destroyed by the Indians during the last few years. Ducks and partridge are fairly plentiful.

Much difficulty was experienced in trying to enforce the laws owing to what looked like a united effort on the part of certain tourists to do all the illegal hunting possible, and to encourage settlers to do the same.

Overseer Thomas H. Johnston, of Royston, reports that the past year has been exceptionally good for fishing. He spent four or five days on Cecebe Lake and Ahmic Lake, and collected about $70 for fishing permits.

Beaver were plentiful while deer were scarce. He would recommend that the latter have a close season for a year.

No violations of the Game Laws came under his observation.

Overseer R. Lambkins, of Loring, reports that the law has been observed fairly well both by the settlers and by hunters coming in from old Ontario.

He is pleased to say that red deer have never been more plentiful than at the present time. There were large numbers of partridge at the opening of the season but since then they have been scarce. Ducks are never seen in large quantities on account of there being no wild rice or feed for them. Moose are very seldom seen, the bush not providing proper feeding grounds for them.

Wolves are not so plentiful in his immediate neighbourhood as they have been in the past, but a few miles away they were heard in good sized packs this winter. He would recommend that the bounty be raised to $25 and that the person catching the wolf be allowed the skin, as they are very hard to catch. Sometimes a man will spend a month without any result, so that until the bounty is raised and the party catching the wolf allowed to keep the skin, there is very little inducement for anyone to go after the wolves.

With reference to fur-bearing animals, beaver are increasing very fast in his locality. Muskrats, otter and mink are holding their own. Fisher and marten are very scarce; he thinks this is on account of so much poison being put out for wolves in the past. Foxes are fairly plentiful. Bears are not very numerous. Lynx are scarce.

Overseer H. W. Reid, of Parry Sound, reports that the fishermen in his division inform him the last season was a very fair one. The spring and summer fishing was very good but it was light in the fall; owing to the mild weather in October the fish did not come on the shoals until very late and then it was too stormy to do any fishing. One man informed him that his nets were down thirteen days before he could take them up.

There were not so many tourists as usual; owing, no doubt, to the war the number of Americans that visited the district was less than ordinary. Angling was very good and there were very few complaints.

Partridge shooting has not been very good, although it was reported at the beginning of the season that there were plenty of birds.

The deer season was an average one. There were a large number of hunters in the woods, and there were very few who did not get their deer, though a large number were small does.

Duck shooting was very poor so far, the birds have not been coming south on account of the mild weather.

Mink and muskrats are reported to be plentiful.

Overseer Murdoch Watts, of Byng Inlet, reports that the catch of whitefish and salmon trout was much larger than in previous years. Pickerel fishing in the Magnetawan River was very good, though not so good as two years ago. Bass fishing was very poor and very few were caught by the sportsmen; although there seemed to be plenty of them in the water they did not bite so well as usual. Maskinonge were very scarce and only one was caught in the Magnetawan River. This solitary one, however, weighed thirty-four pounds. There were not so many tourists in his district last season, owing no doubt to the outbreak of the war.

Moose were very scarce last year but red deer seem to be holding their own and he has received no complaints from the hunters regarding them.

Beaver and otter are very scarce, also mink and muskrat. He recommends that there be a close season for these animals for three years. He is glad to know that fur dealers and buyers are licensed but he thinks the fee is too small and should be raised to $10. He also recommends a trappers' license, the fee to be $2.

Partridge are very scarce, and if there is no close season for them in the near future, they will be a thing of the past in his district. He would recommend a close season of three years.

Duck were not so plentiful as in former years no doubt owing to the fine weather during the fall and the ducks not having come down from the north very early.

Peel County.

Overseer John Bemrose, of Claude, reports that speckled trout fishing was not so good as usual on account of the lack of water in the streams. He does not remember having seen them so low for years. Bass fishing was poor for the same reason, some of the lakes were three feet lower than usual.

The game birds in his district consist mainly of partridge, which are very plentiful, having increased wonderfully since the open season was shortened. Squirrels and rabbits are also becoming more plentiful since their open season was reduced.

Muskrats and mink seem very scarce, there having been a great run on them during the last few years. He thinks it would be a good thing to give them a close season for two or three years.

Overseer James Johnston, of Orangeville, reports that the fishing in his district was very good during the beginning of the season. The black bass in Green Lake were fine and very numerous, although the public were afraid to use them on account of their being infested with tape worm.

Fur-bearing animals are becoming scarce. He strongly advises that they should have a close season for two years, or that trappers be obliged to take out a license.

Game is quite plentiful, rabbits and partridge being very numerous.

Overseer R. J. Walker, of Port Credit, reports that the trout fishing was good. Some trout that were caught seemed to be of a different species, they were shorter and thicker, and looked as if they came from colder waters. Herring and whitefish were much as usual and angling about the average.

Game was very scarce in this district. A stray duck may have been seen, but scarcely any plover or snipe. In Mr. Walker's opinion every year partridge and squirrels are becoming scarcer in that part of the country.

Perth County.

Overseer Charles Jickling, of St. Mary's, reports that black or green bass are quite plentiful, and in some streams there are a number of brook trout. The brown trout placed in Otter Creek in May are going to be a success and seem to be doing well so far; some of them are spawning this fall. These fish are rather hard to catch. The pickerel planted at Lakeside in 1912 are doing excellently and will average about twelve inches in length.

Mink are decreasing every year. Muskrats are plentiful in some localities. Cotton-tail rabbits are numerous wherever they are sheltered. Raccoons and skunks are plentiful. Wherever the hardwood ridges are, black and grey squirrels are fairly plentiful. There are a few partridge, which are slightly on the increase.

Peterborough County.

Overseer William Clarkson, of Lakehurst, reports that the number of tourists who visit his district are increasing every year. The fishermen appeared to be pleased with their catches last year. The number of bass and maskinonge caught is increasing. The trout in the northern lakes are about the same as in 1913. He would recommend that a hatchery be erected at a suitable place on the Kawartha Lakes. He is of the opinion that the close season should be from October 1st to November 30th.

Ducks are somewhat rare, but partridge are plentiful.

Deer are about the same as last year.

Mink and muskrats are plentiful and beaver are becoming numerous. Overseer Clarkson recommends that trappers be licensed.

Overseer Edward Fleming, of Hastings, reports that the angling was good, maskinonge being much larger than in former years and bass becoming more plentiful.

Ducks are not so plentiful, the boats which have been working on the canal having driven them out of the river. Rats are becoming plentiful in the marshes along the river. He thinks a trapper's license would be a good thing.

Overseer John Forsyth, of Bridgenorth, reports that fishing was very good last year. Maskinonge and bass seem to be quite plentiful, although no great catches were made at any one time. The reason for this is because Mud Lake is a real good feeding ground for fish.

Since fishing through the ice has been prohibited, which he thinks was a grand amendment to protect the fish, it seems very hard for some people to keep from spearing fish in the spring. These illegal workers should be fined $50 for the first offence and be given six months in jail for the second.

Ducks were plentiful last fall. Partridge are also numerous. Mink and muskrats are about the same as usual. Deer hunting went on as brisk as ever last season.

Overseer Wellington Lean, of Apsley, reports that partridge are quite plentiful in some localities, while in others they are very scarce.

Wolves are more numerous than they have been for a number of years. He would advise giving a large bounty, thereby encouraging people to kill them. If this were done, deer would become more plentiful. At present they are very scarce, as the wolves are their worst enemies, killing more of them than the hunters do.

Beaver are becoming very plentiful, and he can find no trace of anyone having molested them. He is giving them special attention, and if they are protected for a few more years they will be as numerous as in former years. Ducks were quite numerous.

He would like to recommend the taking of steps to stop dogs running at large from hunting deer.

Overseer John McFarlane, of Keene, reports that the Game and Fishery Laws have been well observed in his district, but there is still a little fishing done out of season, which he finds hard to stop on account of having supervision over such a large district.

Maskinonge fishing was about the same as in 1913, not very good, especially during the summer. Bass fishing was good. Brook trout was scarce, though some good catches were made. There were about thirty-five foreigners repairing the G. T. R. track between Blezard's and Birdsalls' Station, and it was reported to him that they were going to clean out the creek of trout as they were fishing all day Sunday. On week days he went down and put up notices and warned them to stop, which they did.

Trapping was not very good last spring owing to the low water in the marshes. There were plenty of muskrats, but they were hard to get at. Mink were scarce.

Ducks were plentiful in the spring, it was estimated that there would be about 25,000 on the lake if they were not molested. In the fall they were not so plentiful as in other years, probably on account of the fine weather. They took a different flight and did not stop on Rice Lake. Rice was fairly good, but not as good as was expected from the abundance of straw. There were about thirty families of Indians camping on Sugar Island, from the other side of the lake, gathering rice.

Partridge are plentiful, but wild and hard to shoot. Black squirrels are plentiful and cotton-tail rabbits are also putting in an appearance.

Overseer Henry Melville, of Havelock, reports that fish are becoming rather scarce owing to the immense number of people who angle. The lakes and rivers

are covered with fishing crafts during the season, there being a great many tourists and cottagers from all parts of Canada and the United States.

He is of the opinion that a great many tourists are not keeping the law either with regard to the legal number of fish taken or the size of the same, and they will have to be closely watched. His district contains 26 lakes and nearly a hundred miles of rivers and creeks. It would be impossible for him to watch every individual who hunts or fishes, so he prosecutes wherever possible and keeps as close a watch as possible.

Hunters have had fair success with red deer, there being as many, if not more than last year. The number of hunting licenses sold was double those taken out last year. There have been absolutely no complaints from anyone that the law has been broken during the deer hunting season.

From the information he can gather from the trappers and from personal observation, the small fur-bearing animals are becoming less plentiful, owing to the amount of trapping done by the residents; almost everyone does a little trapping and they seem to be observing the law well.

There are scarcely any game birds with the exception of partridges, which seem to be increasing slightly. Ducks are a little more plentiful.

Overseer F. J. Moore, of Lakefield, reports that during the past year the Game and Fisheries Act was fairly well observed in his district, with the exception of a few cases of parties hunting and killing deer without a license, which cases he reported to Inspector Hunter, who disposed of them.

He lifted a quantity of traps which were set in muskrats' houses, and also seized about two hundred yards of net set for maskinonge. Beyond these cases he had very little trouble with the enforcement of the laws.

The past year was an exceptionally good one for the spawning of bass and maskinonge, as the waters in the lakes were so low last winter that in the spring it had to be kept up for navigation purposes, which gave the spawn a chance to mature and get into deeper water before it was lowered.

Tourists had a fairly good season fishing with rod and spoon, more particularly for bass. Maskinonge were not so plentiful. He would recommend that Stoney Lake be restocked with bass, as it is of great importance that the supply of fish be kept up in these waters, Stoney Lake being a great summer resort for tourists from all parts of the United States, as well as Canada. He is of the opinion that the anglers would be willing to pay more for their permits if the fishing were kept up, as they seem well pleased with these waters.

He would suggest that the close season for maskinonge be from the first day of April until the sixteenth day of June.

Deer were quite plentiful in this district last season. Partridge are also increasing since the sale of same has been prohibited. Ducks are not so plentiful.

The trappers had a good season catching muskrats, but mink are scarce. Beaver are increasing very fast, and are now following the streams towards the settlements. He would suggest that the Department assist a little more in protecting these valuable animals. He would also suggest that the carrying of fire arms be prohibited during the close seasons, as there are so many tourists, and these is no necessity for them to carry guns.

Overseer John Watt, of Peterborough, reports that bass fishing was very good, and although there was every indication of there being a great many maskinonge

they did not take the bait. He supposes it was due to their having abundant supply of natural food, as the fish caught were in splendid condition.

Owing to the low water in the spring it was very difficult for trappers to get good sets, or reach their traps; nevertheless the catch was well up to the average.

Ducks seemed plentiful in the spring and summer, but when the shooting season opened not many were bagged in the southern parts, but in the north they were quite abundant and at the time of writing are returning to the southern territory in great numbers. Partridge are plentiful everywhere, the dry spring having apparently been favourable for them.

There are a fair number of deer, and some parties procured their limit easily.

Overseer Watt regrets that he had to lay a number of informations which resulted in about twelve convictions for violation of the Game and Fisheries Act, which does not speak well for the sportsman in his territory. Owing to the valuable assistance the Department authorized him to engage he was able to keep down poaching, but this entailed much hard work. He and his assistants confiscated six gill nets, two spears, and one rifle.

Prescott County.

Overseer F. Dupuis, of Hawkesbury, reports that there were not so many licenses issued last year on account of the low water, which caused the fishing to be not so good as last year.

Ducks were very plentiful, but very few were shot. Partridge are very scarce. Muskrats and mink are fair.

Prince Edward County.

Overseer Angus Brisbin, of Picton, reports that as far as he knows fishing for trout and whitefish was about as good as usual. Fishing for eels with night lines was also very good. Bass were plentiful and he sold quite a lot of permits.

Black squirrels and partridge were very plentiful, but ducks seem to be scarce, especially in the Bay, he thinks this is on account of the cold weather this fall.

He has no fault to find with the fishermen as they have not violated the laws.

Overseer E. R. Fox, of Northport, reports that pike and bullheads were about the same as last year, but from September 15th up to the end of the season the fishermen had a very poor catch owing to the weather having been too fine and warm. The whitefish were quite late coming last fall. The first to be caught in this division were taken about the 20th of October, but they seemed to be as plentiful as ever.

Game seems to be about the same as usual. Black ducks and partridge are increasing. Muskrats are not quite so plentiful as they were about three or four years ago.

There was less shooting before the open season than he has ever known before. A few stray shots were fired after sunset, but he could not secure sufficient evidence to make a conviction.

Overseer E. A. Titus, of Wellington, reports that the fishermen had a good season and were well pleased with their catch. There were plenty of coarse fish taken in hoop nets, and when the salmon fishing came on they appeared to be

as plentiful as in former years. The catch of whitefish was not so good as the previous year. Carp are becoming quite a nuisance, being very numerous in Weller's Bay.

Partridge and ducks were very plentiful. Muskrats appeared scarcer, and he would recommend that the close season should be lengthened to January 1st. Mink are very scarce and there are very few black squirrels.

Rainy River District.

Overseer William Aymer, of Fort Frances, reports that the fishing on Rainy River was not so good as in 1913, especially for whitefish, but some good catches of pickerel were made. Fishing on Namakan Lake was good, some splendid whitefish coming from there. The gill net fishermen seem to be doing the best, though the pound nets on Namakan Lake have done fairly well. The American fishermen fishing the boundary lakes east of Namakan Lake, on the Minnesota side, inform him that their catch has been light. The small lakes north and east of Fort Frances are well stocked with whitefish, pickerel and trout, though in most of them the rough fish, such as ling, jackfish, and suckers, are increasing rapidly.

Partridge are very scarce round Rainy Lake, but are plentiful in some localities off the lake. Prairie chicken are increasing in the western townships. Ducks are numerous, mostly mallard and blue bill, but they are very wild and hard to get at, though some have reported securing good bags.

Moose and deer are increasing, especially the latter. The extension of the open season was much appreciated last season. Rabbits are very scarce. The trapping was good last winter, especially for mink, fisher and foxes; there were also quite a number of lynx caught.

Brush wolves are increasing rapidly, they are very destructive to partridge and fur-bearing animals as well as to deer.

Overseer G. S. Cates, of Emo, reports that deer were not so numerous last year near the international boundary, but seemed to be more plentiful in the unsettled part of the country, owing to the wolves keeping further south than in previous years.

Moose are plentiful a few miles back from the river. Wolves are becoming very numerous, and quite a number of sheep have been killed by them. One farmer near Emo informed him that he had nine sheep killed this year, besides a quantity of turkeys. Lynx are very scarce. Beaver are increasing fast, and in some places are a nuisance. He believes mink, fox and skunk are increasing. Partridge are not very plentiful. Ducks seem to be plentiful, as he has seen a great many in places where he never saw any before.

Renfrew County.

Overseer Samuel Andrews, of Micksburg, reports that he kept a close watch over his district and found the law well observed during the season, no infractions having taken place. There were therefore no fines imposed or nets confiscated. The close season was strictly observed.

Maskinonge and black bass are scarce, and not many were caught. Bullheads, suckers, and pike were plentiful, and a large number were taken.

Muskrats and mink are scare, also ducks and partridge. Red deer are plentiful and are seen even in the settled parts of the county. A few moose were seen in his district last season.

Overseer W. L. Briscoe, of Killaloe, reports that he has kept a close watch over his district in connection with the game and fish, and has found that the people have observed the Game Laws much better than in previous years, as they are learning the benefit derived from the protection of game.

Fish are becoming more plentiful, and the people can go to the lakes and procure what they want by trolling or with hook and line almost any time during June, July and August. Pike are the chief fish caught. Some of them scale as high as twenty-two pounds, while a number of them run between thirteen and sixteen pounds.

It has only been since spearing was done away with and netting in the spring when the fish are spawning was prohibited that there have been any pike.

Partridge are not plentiful, and unless there is a close season for them they will be all killed. Deer are plentiful all through the district, wherever there is any cover for them. Moose are roving around this division, as there were quite a number seen in the neighbourhood.

Beaver are fairly plentiful, there being four families on Silver Lake Creek. Muskrats are rather scarce, also mink. Otter, fisher and marten are very scarce.

Overseer D. E. Burns, of Pembroke, reports that the domestic fishermen claim to have had a fairly good season's catch. Fish are increasing in his district. There was less illegal fishing carried on than last year, the fishermen seeming to realize that they must keep within the law.

There was an abundance of partridge last year. These birds seem to be increasing in this division. Ducks had a good season, the hunters being unable to get near them on account of the water being very low in the river and Mud Lake. Beaver are still plentiful. Otter, mink, and muskrats are scarce. Deer are very plentiful, and are coming down from Algonquin Park. He had a great deal of trouble in protecting the deer and beaver.

Overseer John Devine, of Renfrew, reports that angling has been good in his territory.

Beaver are becoming quite numerous.

He has again to report that wolves are and have been doing great damage to settlers' stock in the Townships of Brougham, Lynedoch, Griffith and Matawatchan in the County of Renfrew. Besides destroying settlers' stock, they are killing a great number of deer, and if possible something should be done to have them exterminated.

Partridge are not so numerous as heretofore, owing in a measure to bush fires and the late, cold spring.

Overseer A. H. G. Wilson, of Eganville, reports that the fish in his district are very fine, pike being the most numerous and largest. A very fine specimen was caught in Lake Clear by trolling, which weighed twenty-one pounds. Trout are fairly good, and there are some black bass in Lake Dore and Mink Lake.

Partridge are as plentiful as they were in 1913, but more difficult to shoot on account of being wild. Ducks were very plentiful, but also wild. Geese are very scarce, though he saw one large flock. There are a few mink and muskrats. Deer are fairly plentiful in the back country and mountains, but not sufficiently so to be

hunted, though a few hunters went out to clear Lake and Opeongo Mountains. There are some beaver at Lake Constant. They are the same family that was there last year.

Simcoe County.

Overseer John Beatty, of Midland, reports that the Game and Fishery Laws have been very well observed in his district.

There have been more fish taken than for a number of years, including some very large maskinonge and pike.

Black, grey and mallard ducks are very plentiful. He thinks it would be better to have the close season for ducks from September 15th instead of the 1st, for there were a number of young black ducks shot that were not able to fly.

Mink are scarce this year, and muskrats about the same as other years.

Overseer Samuel Coulter, of Gilford, reports that the Game Laws have been well observed in his district.

Angling was fair, though very few maskinonge were caught last season.

There are quite a number of black squirrels and any quantity of cotton-tail rabbits. There are not very many partridge in this district.

Overseer B. A. Dusang, of Waubaushene, reports that he seized ten trap nets, eight of which had a lot of pickerel in them, also one hoop net and one night line with 104 hooks on it and one sturgeon.

Angling was good last year, and there were almost as many tourists as usual. He only sold twelve permits less than the previous year. Maskinonge have not been so plentiful.

As regards lake trout the fishermen had the worst season they have had since he has been on duty, the fish not appearing on the shoals until weather conditions practically stopped the fishing.

Ducks were very plentiful, and partridge about the same as in former years. Deer were as numerous as last year. Mink and muskrats appear to be increasing.

Overseer G. G. Green, of Bradford, reports that the spring was rather backward in opening up, and the waters were very low, in fact, the lowest for years, which made the spring run of fish late and very light.

No violations came to his notice, and in all his trips he did not come across a single net.

Bass fishing was fair, particularly during the last few weeks of the season, and a few maskinonge were taken. The Bradford Fish Company had only a fair season and the prospects for the remainder were not bright.

Owing to low water game was scarce. There were practically no ducks bred there at all, only a few blacks and wood duck. At the time of writing he has only heard of twenty-five ducks being killed all told. Partridge were reported rather plentiful, but he found that they were all well able to take care of themselves, very few being killed in his district. Black squirrels were rather scarce. In the Overseer's opinion game will soon be a thing of the past in his vicinity.

There were a few muskrat houses going up. With a close season for about three years his section would be one of the best for fur in Ontario. He thinks that the trappers would gladly work in conjunction with the Department in this matter.

It was reported that there were three deer in the district, buck, doe and fawn.

The rice which showed up a little the previous year was not so plentiful.

Overseer C. G. Gaudaur, of Atherley, reports that during the month of November, 1913, the whitefish in the north end of Lake Simcoe were quite numerous and might be seen in great numbers on shoals and in shallow places frequented by this species of fish. Bobbing for whitefish during the winter was profitable sport. Groups of fish houses could be seen on whitefish and herring grounds in his district and the catches made were above the average.

Spearing for salmon trout through the ice was about the average and some fishermen reported good catches. The spring run of trout which begins on the opening of Lake Simcoe was exceedingly good, and fishermen who troll at the "Deep Hole" say that the trout caught in that particular place were larger than previous years.

The fall run of salmon trout during the month of October was later than usual. As a rule it begins about October 8th, but this year it was well on to the 20th before any fair catches were made with the troll. From then until the 31st all anglers enjoyed good sport in catching plenty of trout.

Maskinonge in Lake Couchiching during the open season far exceeded previous years in number, and all anglers reported a good average catch during the season. One man from Orillia had the pleasure of landing thirty, all of a good size.

Overseer J. H. Laughlin, of New Lowell, reports that he went over his territory several times last season and found that deer were increasing very rapidly. Partridge are increasing also. He thinks it would be an improvement if the rabbit and partridge season opened at the same time, as people go out to shoot rabbits and shoot everything they see.

The fishing was very good last season.

Overseer Robert Leadley, of Barrie, reports that bass were scarce and small, while whitefish were fairly plentiful, and the trout increasing in size and number. He heard of only three maskinonge being caught.

Deer are becoming plentiful in the north-west portion of the Township of Vespra, but it is hard to protect them from dogs. He shot five hounds in September and October.

There were a lot of partridge last fall and the hunters obtained good bags. On account of so much bush having been burnt, they are being driven into a smaller space and are easier to get at. At the rate they are being shot at the present they will soon become very scarce.

Muskrats are plentiful around Little Lake, which is a good breeding ground for them, as the lake is shallow and the shore very marshy.

Overseer William McGinn, of Orillia, reports that bass fishing in Lakes Simcoe and Couchiching was very poor during the summer. In September and October the black bass seemed to collect in large numbers on the limestone rocks in the lower end of Lake Couchiching. He has seen as many as fifteen gasoline boats at this spot, laden with people, all of whom were procuring large catches. Bass are taken out of the waters in the fall of the year, and that is why the summer fishing is so poor. There are plenty of small fish in the lake, such as rock bass, sunfish and perch. Maskinonge are plentiful this year. One man caught thirty-three in Lake Couchiching during the season. Salmon trout and whitefish are very plentiful in Lake Simcoe and are becoming better every season.

The Patrol Boat *Naiad* has done good work in keeping the nets out of the water, especially in the far end of the lake.

Game of all kinds is scarce in Simcoe.

Mink, muskrats, black and red squirrels are very scarce.

Overseer Harry Mayor, of Painswick, reports that trout, whitefish and herring are plentiful, and in spite of the large quantities of whitefish and herring taken each year there seems to be no decrease in the supply.

Anglers report that bass are very scarce.

The coarser varieties of fish, such as carp and mullet, are in abundance everywhere.

A few attempts were made at jacklight fishing early in the season, but after circulating a warning, fishing by that means ceased, and he has not seen a jacklight on the lake since.

With regard to game, he is pleased to report that partridges are increasing in a very satisfactory manner, while hares, cotton-tail rabbits and squirrels are in abundance.

Fur-bearing animals are about as numerous as usual, although, owing to the low price of furs, not many have been taken, which will no doubt increase the number next year.

Overseer Samuel Patterson, of Dunkerron, reports that maskinonge and pickerel seemed to be more plentiful than formerly and black bass were very numerous. Whitefish were very scarce.

Partridge were numerous, but black squirrels rare.

Overseer T. W. Robinson, of Collingwood, reports that whitefish were more plentiful than last year. Brown trout were not quite so plentiful. Very few sturgeon were caught.

The only game to be found in his district are partridge, and there are not many of them.

The laws were well observed. He received only one complaint, which upon investigation proved groundless.

Stormont County.

Overseer W. A. Anderson, of Cornwall, reports that there was less fishing than in former years, but it was good, especially for pickerel.

Ducks were late in showing up in the fall owing to the warm weather. Partridges are more plentiful than they have been for years.

Overseer John Senecal, of Cornwall, reports that pickerel are decreasing in number, while maskinonge and black bass are plentiful. All other fish are about the same as other years.

Ducks are increasing, but there are no wild geese. Muskrat are scarce; mink and partridge very scarce. With the exception of hares, which are not plentiful, there is no other game in his district.

Thunder Bay District.

Overseer L. E. Bliss, of Nepigon, reports as follows: The Nepigon River is one of the greatest if not the greatest trout fishing stream in the world. Year after year tourists and sportsmen come from the United States and Europe to fish in the Nepigon. There are no other fish caught in this river. The last season was a very good one, the tourists, one and all, reporting good catches and some very large trout were taken. Last year the Department engaged men to take the pike, which were becoming numerous, out of the river. These fish are very detrimental

to the young trout. The pike were caught in hoop nets and taken to the shore and buried. If the same thing is done next year it will go a long way towards ridding the river of these fish. In Lake Nepigon may be found lake trout, whitefish, sturgeon and black bass. Very little fishing is done in Lake Nepigon, the Indians being the only people who use nets, and they do so for their own use only.

Moose and caribou are very plentiful in the Nepigon Forest Reserve. I have never been on a trip of inspection without seeing one or more. There is very little hunting of moose in that section of the district, they are therefore on the increase.

There are a very few red deer.

Partridge and duck are very plentiful, especially the latter, Lake Nepigon and Nepigon Bay proving splendid grounds for them.

Overseer Fred Gammond, of Slate River, reports that over his territory the Game Laws have been fairly well observed.

Moose are becoming more scarce every season. He would recommend that the open season for big game in his district be changed. At present it opens too early and the weather is too warm to preserve the game. He is also of the opinion that the season should be shortened to two weeks. Red deer are about the same as in former years. Caribou have left his district and gone further north.

Beaver are becoming very plentiful. Muskrats are increasing. Fisher, marten, mink, otter and lynx are very scarce and he would suggest that they have a close season for two years. Partridge seem to be very plentiful in some parts, he has seen as many as twelve in one day.

Victoria County.

Overseer William Adair, of Norland, reports that maskinonge fishing was very good, but bass was not so good as in previous years, and trout about the same as usual.

Beaver are very plentiful owing to the protection given them and otter are on the increase. Muskrats are fairly plentiful and mink scarce. Deer and partridge are as plentiful as usual. Ducks were scarce.

Overseer J. R. Boate, of Fowler's Corners, reports that bass and maskinonge were more plentiful last season. The chief fish taken in his district are bass, maskinonge, perch, sunfish and catfish.

Muskrats and mink are not so plentiful as last year. In his opinion they should not be trapped in the fall.

Ducks were very plentiful last season and some good bags were procured. Rabbits are numerous and partridge are increasing every year.

Overseer C. Burtcheall, of Coboconk, reports that the season for fishing was not so good last summer as the previous one, and that there were not as many big fish as other years. The scarcity may be due to the fish having been taken out during the spring, though he saw no one fishing during the close season: still he feels sure some must have been taken. There are so many creeks and bays to watch, it is impossible for one man to detect all illegal fishing.

There is very little game left in his division though partridge seem to be on the increase. Deer are very scarce. Mink or muskrats have practically disappeared but there are a few racoons and beaver are becoming more numerous.

Overseer A. Bradshaw, of Lindsay, reports that during the past season, bass and maskinonge fishing has been particularly good. When the angling season

opened, some very fine catches were made. He has no doubt that the work performed by the special patrols appointed by the Department for the protection of the fish whilst spawning, will have a very far reaching effect, and if continued for a few years will materially increase the supply of these the finest game fish.

At the opening of the shooting season ducks were not so plentiful as in other years in some localities. He is of the opinion that this was caused by the great number of motor boats and other crafts navigating between Lindsay and the lower lakes. Later in the season the ducks seemed to be as numerous as in past years. Partridge were very numerous.

In the spring mink and rats were found in their usual numbers although some of the buyers stated that they had procured more fur than in previous years.

Overseer J. J. Irwin, of Dalrymple, reports that during the spring, carp and an abundance of suckers are the main fish to be found in the waters of the canal. Maskinonge are becoming more plentiful in those waters. The Brantford Fish Company shipped about twenty-three and a half tons of carp from the lift lock last season.

Angling on Mud Lake was good, especially for maskinonge and pickerel. Bass were not quite so good.

Mink and muskrats on the canal and Talbot River were about the same as the previous season. On Mud Lake, mink were about the same but muskrats were not so plentiful.

Otter appears to be about the same as formerly.

Ducks and partridge were plentiful. Deer are increasing.

Overseer John Jones, of Fenelon Falls, reports that the coarse fish such as suckers, carp, bullheads, ling and perch should be taken out of Lakes Sturgeon, Balsam and Cameron. Carp in particular which are coming in quickly by the lift lock from Lake Simcoe. He has been so advised by other people and considers himself that it would be a good thing to do. He understands there is a way by which these fish can be taken out with hoop nets, but the Department should be careful whom they license to do this work.

He is of the opinion that the close season for trout should be from October 1st to November 1st, as they are generally spawning from October 10th to November 10th.

Fishing was very good this season.

He would suggest that the bounty on wolves be raised, as they are doing considerable damage and if this were effected many men, now out of employment on account of lack of work in the lumber districts, would go out and hunt the wolves.

During his trip on special patrol in the Haliburton District he found deer very plentiful. Beaver and otter are apparently very numerous.

Ducks, partridge, muskrats and mink have been fairly plentiful.

Overseer C. W. Parkin, of Valentia, reports that maskinonge were more plentiful last summer. Large bass were scarce; the catches were small and a great many undersized fish were caught and returned to the water. Only a few Americans came to this district to fish.

The waters were so nearly depleted of frogs that it will take some time for them to become plentiful; but they are increasing slowly.

Ducks were very plentiful. They are becoming more numerous every year; owing to the good protection afforded them, a large number of red heads, blue bills and blacks now hatch in the marshes.

Partridge are becoming more numerous every year.

Wild geese stayed around in large numbers feeding on the wheat fields on their way north. Owing to the cold weather in the spring, they did not arrive until a few days before the season closed, consequently only a few were shot.

Hares and cotton-tail rabbits are very plentiful.

Muskrats seemed plentiful last spring, but the nights being rough and cold, there were not so many captured as usual.

Mink are slowly increasing.

The people are beginning to see the importance of the observance of the law for the protection of the country's fish and game.

Overseer H. B. Parker, of Bobcaygeon, reports that the fishing was not quite as good last year as in 1913, especially for maskinonge. Bass are holding their own better than maskinonge.

He would call attention to the necessity of building a fish hatchery on these waters to propagate maskinonge, as so many tourists visit the district for angling.

Partridge and ducks were about the same as the previous year. Deer were very numerous last fall and hunting parties got their number before the end of the season with very few exceptions. Mink and muskrats are about the same as usual while beaver are on the increase.

Overseer Ira Toole, of Omemee, reports that the maskinonge fishing was not nearly so good as the previous season, owing no doubt to the large numbers taken out during the preceding two seasons. Angling for bass was very good, but this is not carried on to any great extent in his district.

Frogs have increased very well owing to the protection they have received during the last few years.

Muskrats are holding their own as well as could be expected considering the number caught every spring. Mink continue to be very scarce.

Ducks were about as plentiful as usual last season, but the late fall ducks have become fewer during the last three seasons. Partridge were very plentiful last fall, much more than for a number of years. There are also a number of black squirrels to be seen which is something new for his district.

The Game and Fishery Laws have been very well observed by the local sportsmen, but the same cannot be said about parties coming in from outside points, especially Peterboro.

Waterloo County.

Overseer Louis Sattler, of Berlin, reports that the laws have been fairly well observed in the Township of Waterloo, only one conviction having been made.

Fishing along the Grand River was not so good as in former years, owing to the sugar factory polluting the waters last year. Trout are scarce, and he would suggest that the open season be shortened one month.

Partridge were reported to be more numerous than of late years. Mink were becoming scarce but muskrats showed no decrease. Cotton-tail rabbits were the most numerous of any game, though he would like to see hunting with ferrets prohibited.

Overseer Edwin Scherer, of New Hamburg, reports that last season was the first for years that black bass were caught in the Nith River. Quite a number measured from fourteen to eighteen inches in length.

There are a number of brook trout, but they are all in rented streams. He saw one that was caught in the open season weighing six pounds.

Black and grey squirrels are becoming fewer every year, and he thinks that there should be a close season for squirrels in the County of Waterloo for a few years to give them a chance to increase.

Cotton-tail rabbits are becoming very plentiful and are causing a great deal of damage. The farmers are complaining all the time.

Coons are very numerous and a great many are caught. Mink are very scarce. Muskrats are plentiful and a number are trapped.

Partridge are quite plentiful, they had a good spring for hatching.

Welland County.

Overseer G. J. Briggs, of Bridgeburg, reports that the early angling in Niagara River for blue pickerel was very good, and for perch fairly good. Black bass fishing was very satisfactory except in the vicinity of Crystal Beach, where it was very poor.

There were very few squirrels last year, but pheasants were more plentiful than usual.

Wellington County.

Overseer Colin Robertson, of Hillsburg, reports that the fish in his territory are mostly brook trout. Early in the season he had the laws and regulations posted up round the ponds and in public places.

The regulations re sawdust and refuse have been well observed by the mill owners.

Mink, foxes and rabbits are plentiful. Muskrats, partridge, wild duck and wild geese are scarce. There are not many otter, deer, beaver, bear or other large game in his district. There is scarcely any shooting of large game on account of its being so scarce.

Wentworth County.

Overseer C. J. Kerr, of Hamilton, reports that the licensed fishermen fronting Wentworth County state that the fishing was fair during last summer and there was great promise of a large catch of herring this fall.

Last April he received one million whitefish fry from the Sandwich hatchery, which he took to Winona and placed in Lake Ontario, one mile from the shore on the whitefish bar and in May about 6,000,000 lake trout fry which he also took to Winona and placed in the lake there. Both the whitefish and the trout fry were in excellent condition and were given the most careful attention.

Angling and trolling in Burlington Bay was fair.

Duck shooting on the bay was very good last fall, many men shooting the legal limit of 200. The overseer received some complaints of moonlight or night shooting and he had to seize and confiscate the ducks, guns and boats of two parties who were persistent in this work. Others complained that the sunrise and sunset clause is drawing the line too fine, and that half an hour before sunrise and half an hour after sunset would be fairer. He agrees with this himself, and he can speak from long experience on this point; he is also of the opinion that the season should be extended to the 1st January. This would provide shooting during the Christmas holidays, and a great many coweens and

other inferior ducks could be shot at that time. He recommends that this be effected provided the screening is stopped, which is done by stringing out the decoys to the full limit of 200 yards, then hiding the boat in rushes and when a flock of ducks light among the decoys on the outer edge, sneaking out with the boat well screened with rushes to where the live ducks are and at close range slaughtering the whole flock. An ordinary duck shooter has no chance of getting within close range of the ducks against a screener. He would make the limit 50 yards and let there be equal rights to all, and no favours for the screeners.

Cotton-tail rabbits are becoming a nuisance and a pest to the fruit growers and to the farmers, causing more trouble than all the other game put together. One farmer threatened to sue the Department for damages for fruit trees destroyed, while another man complained that the cotton-tail rabbits were not getting enough protection.

The small .22 rifle is becoming one of the biggest nuisances he has to contend with. Every boy who can get the money together has one. Complaints come pouring in to him every day that boys and men are killing dogs, chickens, pigs, cattle and horses throughout the surrounding neighbourhood of Hamilton. Although the criminal code confines the selling and carrying of fire arms to persons sixteen years of age, all the boys he meets with rifles say they are over sixteen. The remedy for all this is to put a license fee on shot guns of $2, except for farmers shooting on their own farms, and let there be no license for rifles except for killing deer, moose, etc.

A few non-resident anglers tried to take more than the legal number of bass, and in several cases he was obliged to seize and confiscate the fish. He finds, however, a great improvement this year over other years in the observance of the laws. Overseer Kerr is of the opinion that the licensing of the fur dealers should be followed up by licensing trappers, except farmers who may trap on their own property. A great deal of trapping is done in the Dundas Marsh and the marshes surrounding Burlington Bay, also throughout the Counties of Wentworth, Halton and Wellington, as there are numerous swamps and creeks in the back townships of these counties, also small lakes and ponds which abound with mink, coon and muskrats. Skunk may be found anywhere throughout the above counties. There are any amount of men who do nothing but trap during the season and state that they can make more money at it at that time than at anything else.

The motor boats in his charge are of great value, especially the smaller one which is for marshy waters. It has fulfilled all expectations and has proved well worth the money spent on it when the Department equipped it with a motor. When not in service it is always on the rollers in the boat house ready to put out day or night at a minute's notice when occasion demands it.

In conclusion he wishes to thank the Chief of Police and Inspector Coulter, who have given him assistance during the year when he was hard pressed in rounding up foreigners who were shooting in the close season.

York County.

Overseer Robert Tillett, of Roach's Point, reports that there were some good catches of bass made, and maskinonge trolling was good. There seem to be a great number of whitefish in Lake Simcoe, as all the men who had night line licenses to take whitefish report good catches. Salmon trout are plentiful.

There are not many fur-bearing animals. Black squirrels are more plentiful than they have been for years.

Overseer A. E. Tarry, of Toronto, reports that there was no improvement in the quantity of fish caught in the lake by the licensed fishermen, if anything there were less whitefish and herring taken than the previous year. Trout were exceptionally scarce. Several of the fishermen had to give up fishing early in the season on account of the poor catch they were procuring.

Angling has become very poor. There are no fish to be had in Toronto or Ashbridge's Bay except carp, with which the bays are overrun. He would advise that the waters be rid of the carp. The suckers in the rivers and creeks were not so plentiful in the spring as they were the year before according to the reports of the dip net fishermen.

Last season was a poor one for ducks and very few geese were seen. Muskrats and mink are becoming scarce owing to the Harbour Commissioners filling in all the marsh land.

Overseer Charles West, of Holland Landing, reports that the fishing was better last year than in 1913, and he has every reason to believe that all kinds of game fish are increasing very rapidly, especially black bass and maskinonge.

Shooting last fall was very poor. Ducks were very scarce, but small game such as partridge, rabbits and black squirrels are increasing. He suggests that mink have the same protection as muskrats, or there will soon be none to protect.

Overseer G. W. West, of Holland Landing, reports that black bass and maskinonge are increasing in Cook's Bay and Holland River judging from the amount he has seen taken in and returned to the water by the Bradford Fish Company, but from what he can learn, there have been very few maskinonge taken with hook and line. This he thinks is owing to the large amount of small fish in the water. Whitefish are more plentiful in Cook's Bay than they were some years ago, on account of the large amount of food provided in the bay and river.

Ducks and snipes are scarce owing to the very dry marsh and scarcity of wild rice. A few geese went south last season. Partridge are increasing but very few are killed as they are so wild.

Hares and cotton-tail rabbits are increasing. He finds that all kinds of fish and game are holding their own except woodcock, which are scarce on account of the swamp and low lands becoming cultivated. Mink and muskrats show no sign of decreasing. Squirrels are as plentiful as they have been for some time.

REPORT OF MOUNT PLEASANT HATCHERY.

Mohawk, November 30th, 1914.

A. Sheriff, Esq.,
Deputy Minister of Game and Fisheries, Toronto, Ont.

Dear Sir,—I beg to submit the following, my sixth annual report in connection with my work at the Mount Pleasant Hatchery.

The output totalled over 500,000, which greatly exceeded that of former years.

Five bass ponds were made use of and the half million fingerlings were successfuly transplanted in some fifty different inland lakes and rivers. They were in the best possible condition, very few dying in transit. Though the waters stocked have not received sufficient fingerlings for all time, the fishing will be greatly improved if the fry are allowed to mature and no unlawful means are used in catching them.

While I recognize that it taxes your utmost efforts to meet the demands for fish to restock the depleted waters throughout the Province, I would recommend that next year, the most important lakes shall, according to their size, receive a sufficient quantity of fingerlings to last for several years.

Transplanting.

Undoubtedly, in the past, a considerable quantity of fish have been improperly transplanted by persons who have not been thoroughly conversant with their habits. This year, however, the transplanting was very carefully undertaken, in co-operation with myself, by Mr. Henry Watson, special officer of the Department in charge of fish restocking, who has shown such great judgment with regard to this important work that the very best results may be expected.

Fish Car.

The new fish car, Beaver No. 1, is a vast improvement on the old one, not only with regard to the handling of the fish but also the comforts provided for its occupants. The courtesy and assistance rendered by the different railway officials, with two exceptions, was all that could be desired.

The Hatchery.

The flower beds which are numerous were very fine and their bloom most prolific, the natural moisture makes it an ideal place for flowers, and altogether the hatchery presented a fine appearance. It is fast becoming a spot of great interest to the many thousands who visit it during the summer season. The grounds are being sodded over and considerable time is occupied in cutting the grass and keeping everything tidy.

Construction Works.

One bass pond was completed, making six ponds which may be used for breeding purposes next season. Some 700 feet of pipe was laid. The creek has been diverted and two dams built, thus completing the creek except for the rip-rapping which will have to be done to keep the banks from washing out.

A trout hatchery building 82 by 27 ft. has been completed, and in this the Department is congratulated, as it is the finest it has been my privilege to see. The construction was carried on under the direction of Mr. A. J. Halford, Chief Engineer of the Public Works Department. A series of twenty-one ponds were commenced but had to be abandoned until the spring, on account of the cold weather setting in.

An ice house was also erected, as a considerable amount of ice has to be used at shipping time.

With favourable weather conditions during 1915, the season should be an excellent one.

I remain,

Your obedient servant,
J. T. EDWARDS,
Superintendent, Mount Pleasant Hatchery.

REPORT OF WORK PERFORMED BY THE PATROL BOAT "NAVARCH" ON THE RIDEAU WATERS AND BAY OF QUINTE DURING THE YEAR 1914.

Considerable time was spent at the beginning of the season in fitting out this boat with a new boiler, and Captain Fleming was unable to begin cruising until June 17th. For the remainder of the month he patrolled to Simcoe Island, Gananoque, Kingston, Belleville, Brockville, Sandhurst, Brighton Bay, Trenton, Amherst Island, Deseronto, Wolfe Island, etc.

On July 11th he patrolled to Harrowsmith and Petworth for the purpose of looking over the dams. For the next few days the "Navarch" lay at Kingston having her boiler repaired. On the 16th he buoyed out the Gap for the fishermen, and from there he patrolled around Amherst Island and into Collins Bay, around the Brothers Island and Snake Island to Kingston. During the last week of July he patrolled down the Rideau River as far as Ottawa.

On August 6th he seized one gill net in the County of Russell between Cumberland and Rockland. On the 8th he patrolled from Fawcet to Point Duchene where he seized seven sets of hoop nets and four leaders, also one night line. Between Mantabello and Wendover he seized a night line, and two gill nets between Wendover and Rockland in the County of Russell. On the 10th he seized two bags of hoop nets between Rockland and Ottawa, and two leaders about four miles west of Cumberland. He left Ottawa on the 11th and patrolled to Kemptville Creek, then on to Smith's Falls, Newboro, Kingston and Belleville. On the 20th Engineer Wilder became ill and Capt. Fleming was obliged to patrol the vicinity with the motor boat.

During September he visited Jones' Creek, Brockville, Grenadier Island, Gananoque, Howe Island, Kingston, Big Bay, Collins Bay, Amherst Island, Upper Gap, Hay Bay, Picton, Wolfe Island, Lower Gap, Deseronto, Smith's Falls, Newboro, Ottawa, etc. On the 16th he seized 2,000 yards of gill net, small mesh, in the vicinity of Deseronto, and on the 26th he seized five bags of hoop nets and leaders and six gill nets above Cumberland in the County of Russell. The following day he seized two bags of hoop nets, one leader, and six gill nets at Rockland.

On October 8th Mr. Charles McGreeny was taken on board for the purpose of finding out where the International boundary line near Wolfe Island is situated. On the 14th he seized about two hundred yards of three inch mesh gill nets. On the 19th Mate Taylor patrolled above the bridge at Belleville and seized one bag of hoop nets not tagged. The following day Capt. Fleming seized fifteen or sixteen hundred yards of gill net in the vicinity of Point Ann. On the 26th he seized about fifteen hundred yards of gill net in the vicinity of Glen Island. Mate Taylor seized four hundred yards of gill net in the vicinity of Belleville on the 31st.

During the first two weeks in November, Capt. Fleming patrolled to Baker's Island, Massassaga Point, Belleville, Mosquito Bay, Shannonville River, Nigger Island, Fish Point, etc. On the 7th he seized 189 lbs. of small whitefish, also 7 whitefish from another party. The following day Court was held on the "Navarch" and the party was fined $25 by Inspector Hunter, for selling undersized whitefish. The boat was laid up for the winter on November 11th.

REPORT OF THE WORK PERFORMED BY THE PATROL BOAT "NAIAD" ON LAKE SIMCOE AND KAWARTHA LAKES DURING THE YEAR 1914.

Capt. Carson commenced the season's patrol work on May 5th and with Capt. Fleming on board visited Baxters Creek, Halls Bridge and Squirrel Creek, where they met Overseer Thompson who reported catching two men spearing fish illegally. The remainder of the week he patrolled to Gore's Landing, Burnetts Mills, Jubilee Point, River Ooz, Hastings, Healy Falls, Rainy Point, Harwood, Bewdley where he took Overseer Kent on board, and patrolled to Carter's Bay and up the creek with a skiff.

The following week and until the end of the month he patrolled to Young's Point, up Clear Lake to Stony Lake—where he met Overseer Moore—Glenwood, Jack's Creek, Eels Creek, Mount Julian, McCrackens Landing, Burleigh Falls, Lovesick, Buckhorn, Chemong Village, Bridgenorth—where he met Overseer Forsyth—Herrons Island, Gannous Narrows, Oak Orchard, Sturgeon Point, Fenelon Falls, Cameron Lake, Balsam Lake and into the Kirkfield Canal. Here he seized one spear belonging to an Indian and a little further up the Canal he took a trawling line and a gaff. The former was wet and had been used lately. He also visited Thora Island, Woodman's Shoal, Shanty Bay, Barrie, Sebastopol, Sandico Bay, Bradford, Roaches Point, Fox, Strawberry Island, McGinn's Point, Thompson's Bay, Orillia, Rama, Atherley, Jackson's Point, etc. He was informed that a net was illegally set off Eight Mile Point but could find nothing there. On the 26th he took Chief Inspector Holden on board and patrolled to the Kirkfield Canal.

During June he patrolled to Bobcaygeon via Balsam Lake, Fenelon Falls, Lindsay and Emily Creek, thence to Lakefield via Gannous Narrows, Chemong Village Burleigh Falls, and McCrackens Landing, then on to Beaverton and Peterboro. He often took the skiff and patrolled up the smaller creeks on the way, making a thorough search through all the waters for any signs of illegal work.

On the 17th he deposited in Pigeon Lake near Bobcaygeon, 25,000 bass fry which had been brought for that purpose from the Mount Pleasant Hatchery by Mr. Henry Watson, special officer in charge of the planting of young fish, and Superintendent Edwards of the Provincial Hatchery.

On the 20th the boiler gave out and he was obliged to have it repaired at Beaverton. Boiler Inspector Bradt met him on the 22nd and overhauled the boiler. On the 26th he sold seven angling permits and one guide license. He searched eight rowboats but all the owners had permits.

July was spent in visiting the above places, keeping up a thorough patrol through the Kawartha Lakes and searching for illegal work. He interviewed Overseers Clarkson, Thompson, McAllister, McFarlane, Forsyth, Johnson, Moore, McGinn, Gaudaur and Irwin, at intervals during the season to discuss fishery matters with them. On the 18th he left Bobcaygeon with Mr. Henry Watson on board and 35,000 bass fingerlings which were distributed in Stoney Lake and Clear Lake. On the 27th he patrolled to Buckhorn with Inspector Hunter on board, and the following day they met the tug "Marie Louise" with her boiler out of order and leaking badly, so they towed her to Lindsay.

During August he patrolled his district carefully, examining the boats to see that all anglers had their permits, he also examined the books of express companies to see that no illegal fish were being shipped.

Through September and on until the end of the season he visited Deer Bay, Lovesick, Burleigh Falls, South Bay, Bellevedue, Juniper Island, South Beach, Young's Point, Lakefield, McCrackens Landing, Glenwood, Mount Julian, Peterboro, Hall's Bridge, Bensford Bridge, Jubilee Point, Healy Falls, Hastings, Trent Bridge, Stoney Lake, Otonabee River, Rice Lake, Harwood, Bursford, Buckhorn, Gannous Narrows, Pidgeon Creek, Little and Big Bauld Lakes, Lindsay, Rosedale, Fenelon Falls, Cameron Lake, Barrie, Shanty Bay, Hawkeston, Sebastopol, Allendale, Strawberry Island, Thora Island, etc.

On October 5th he picked up three night lines off Fox Island, they all had the owners' names and number of licenses so he left them there. On the 15th he seized a new net in the vicinity of Thora Island and on the 17th he found 200 yards of net set in the same locality, very close to the shore.

During the first week of November he had new shaker grates installed in the boiler of the boat and on the 10th he started laying up the launch for the winter.

REPORT OF THE WORK PERFORMED BY THE PATROL BOAT "LOTUS" ON THE WATERS OF THE NORTH CHANNEL OF LAKE HURON AND GEORGIAN BAY DURING THE YEAR 1914.

Capt. Irwin commenced the season's patrol work on May 6th by visiting Killarney. From there he went on to the French River where he spent a day or so on patrol work, and then on to Parry Sound. He next visited Penetang, and patrolled among the islands with the small boat, then on to Owen Sound and Tobermory where he lifted some night lines and hooks, and back to Little Current, calling at Fitzwilliam Island on the way.

During June he patrolled to Manitowaning, calling at Sheguiandah on the way, Whitefish River (with Overseer Ramesbottom on board), Kagawong, Gore Bay, Blind River, John Isle, and with Overseer Bradbury on board, visited the Soo.

On July 2nd he patrolled to Killarney and the following day to Byng Inlet. The next week he visited Point Aux Baril, Parry Sound, Whelands Landing, Penetang, Mimico and during the remainder of the month, Midland, Copper Head, The Bustards, Little Current, Gore Bay, Duck Islands, Cockburn Island, Serpent Isle, Milford Haven, Whiskey Bay, Lake George, Sault Ste. Marie, and Hilton.

On August 17th he took Overseer Lewis and Capt. Hunter to Manitowaning, and on the 19th he visited Kagawong. Many of the above named places were visited during this month and September.

On September 24th and 25th he visited Meldrum Bay then on to Duck Island, and on the following day he examined the Purvis fishery. On the 28th he went to Rattle Snake Harbour, calling at Providence Bay on the way.

On October 14th patrolled to St. Joseph's Island and examined Patrol Boat "Laura," returning the next day to Spanish. On the 20th he went to Sheguiandah and took Overseer Lewis to Killarney. On the 22nd he visited Round Island, and on the 30th laid up the boat for the winter.

REPORT OF WORK PERFORMED BY THE PATROL BOAT "JESSIE T." ON THE WATERS OF LAKE SUPERIOR DURING THE YEAR 1914.

Capt. Shappee's first trip for 1914 was made on May 5th to Richards Landing. He rowed five miles and dragged for nets but did not find any. The following day he patrolled to Mosquito Bay, then on to Hay Point, Echo Lake and back to Sault Ste. Marie on the 9th. During the remainder of the month he visited Batchawana, Persian Island, Maple Island, Rudder Head, Copper Mine Point, Goulais Bay, Gargantua, Lizard Island, Sand River, Clay River, Groscap, Richard's Landing, Hilton Landing, Whiskey Bay, and Point Aux Pines.

The first two weeks in June were spent in repairing the engine and during the last two weeks most of the above named places were visited as well as Otter Head, Ganby's Harbour, Little Bruley Harbour, Mamac Point, and Indian Harbour.

On July 16th he patrolled to Gargantua Harbour, Lizard Islands and Agawa Rocks, the following day making for Michipicoten Harbour, Indian Harbour and Bruley Harbour, and on Saturday, the 18th, he visited Otter Head laying there over Sunday, returning to Sault Ste. Marie the following week via Cousins Harbour, Indian Harbour, Copper Mine Point, Batchawana, etc.

August was spent in visiting the above named places.

On September 2nd he patrolled to Whiskey Bay in order to watch the duck hunters. On the 8th he visited Point Anx Mines and called at Batchawana and Mamaise Point. He then proceeded to the Agawa River, via Lonely Bay and Montreal River and the following day to Michipicoten, laying at Otter head over the week end. The week commencing Septmber 14th was spent on the Pucksam River watching for poachers. On the 19th he patrolled Dog River and on the 22nd he examined some of the tourists' camps, but found everything as it should be.

During October and until the end of the season he patrolled to Michipicoten, Indian Harbour, Little Bruley, Agawa River, Gargantua, Lonley Bay, Goulais Bay, Batchawana, Richards Landing, Whiskey Bay, Maple Island, Garden River, Harmony River, Groscap, and Echo Bay. On November 24th the boat was laid up for the winter.

WORK PERFORMED BY THE LAUNCH "GLADYS R." IN THE RAINY RIVER DISTRICT DURING THE YEAR 1914.

Overseer Aymer took charge of this boat on May 1st and went for several short trips during May. On June 2nd he left the engineer working on the launch, and taking the small rowboat patrolled amongst the islands east and west of Sand Point. The following week he visited Bears Pass, Bleak Bay, Seine River, Rat River, Pipestone River. The rest of the month he was obliged to patrol with the rowboat as the clutch and engine of the launch gave considerable trouble and had to be repaired.

During July he visited Brule Narrows, Swell Bay, Grassy, Portage Bay, Sand Point, Cormorant Bay, Kettle Falls, Wild Potato Lake, McDonald's Inlet, Suede Narrows, Hook Island, Frog Portage, Red Gut Bay, Black Sturgeon Lake. On the 26th he was informed that a party had passed through Bears Pass in a rowboat with what looked like moose meat on board. On the 29th he and Constable Campbell searched Giroux Camp on an island and found some moose meat. The following day they arrested Giroux and two other men and took them to Fort Frances. On August 1st he secured a conviction against Giroux.

In September he patrolled from Rock Inlet to Woodchuck Island and a part of the North West Bay and Shelter Bay, in the rowboat. He noticed a quantity of ducks and a considerable amount of wild rice seed.

During October he visited Kettle Falls, Blaze Point, Hook Island, Alexandria and Ash Bays, Suede Narrows, Hopkins Bay, Bears Pass, Reef Point, and on the 18th the boat was laid up for the winter.

During the season he searched a number of boats to see if there were any guns, but was unable to find any.

REPORT OF WORK PERFORMED BY THE PATROL BOAT "ELLA C." ON THE RIDEAU WATERS DURING THE YEAR 1914.

Mr. Phillips began the season's patrol work on June 2nd, visiting Jones' Falls, Big Rideau, Rocky Narrows, Smith's Falls, etc. On Monday the 15th he patrolled to McLean's Bay, Narrow's Lock's, Adam's Lake, and the following day to Portland, German Bay, and during the remainder of the week to Noble's Bay, Rideau Ferry, Tar Island, Hogg's Creek, Newboro—where he interviewed Overseer White—Gem Island, Garrett's Rest, Long Island, Foster's Bay, Stone House Point, Smith's Falls.

The above places were visited many times during the season, as well as Poonahmalee, Rocky Narrows, Boxes Island, Oak Island, Bass Bay, Perth, Long and Trout Islands, Tar Island, McVeety's Bay, and Westport.

During August and September he paid particular attention to the duck grounds to see that no illegal shooting was carried on. He often took the rowboat and patrolled the small creeks, and was sometimes assisted by Overseer Burke.

On October 23rd he patrolled up to German Bay at night with the rowboat and seized one gill net at Tar Island shoal, but was unable to find the owner.

October 31st was spent in pulling out the boat at the Rideau Ferry and storing her for the winter.

REPORT OF WORK PERFORMED BY THE LAUNCH "HELEN" ON THE WATERS OF THE ST. LAWRENCE RIVER DURING THE YEAR 1914.

Overseer Toner commenced patrolling as early as February 5th. His first trip was down to Gray's Creek, and the following day to Legg's Creek. On the 14th he went to Sugar Island, having received a report of shooting there by Americans, but they had left before he got there. He also visited Hemlock and Black Duck Islands, Landon's Bay, Leek Island, Burnt Island, Squaw Island, Huckleberry Island, and Mud Creek.

On April 19th he seized four sets of gill nets, and on the 26th six nets. On the 28th he took up one and a half miles of night lines in the vicinity of Grenadier, when he returned to his launch he found the clutch broken and had to be towed home.

On May 2nd he took up a night line, on the 11th he seized a gill net in Landon's Bay, and on the 14th two gill nets in Longbridge Creek. The next two days he seized one night line in the vicinity of Float Island and one gill net near Sugar Island. On the 25th he patrolled down to Jones' Creek and took up one set of hoop nets and one night line. On the 29th he took up a night line in the vicinity of Union Park.

On June 3rd he seized ten sets of gill nets at the foot of Grenadier, and another gill net among the islands on the 5th. During the week commencing June 8th he patrolled to Landon's Bay, Rockport, Howe Island, Tar Island, and seized five night lines and one set of gill nets which belonged to some Americans whom he was watching.

During July and August he visited Howe Island, Brockville, Gananoque, Rockport, Tar Island, Jones' Creek, Grenadier Island, Mud Bay, Hickory Island, Thompson's Bay, and Wolfe Island. He seized five sets of gill nets and one night line.

On September 8th he was out all night watching some Americans and seized three of their nets, and the following day he took up two more sets of gill nets. Again, on the 13th, he was out all night watching some parties and seized three of their nets.

On October 2nd he took up a night line, and the following day two sets of gill nets in the vicinity of Jones' Creek. During the remainder of the month he visited Marblerock, Hickory Island, Landon's Bay, Float Island, Howe Island, Longbridge Creek, Brakies Bay, Sugar Island, Rockport, and Wolfe Island. He seized two sets of gill nets.

During November—from the 1st-15th, when the season ended—he seized one trap net, five night lines, and 4 sets of gill nets.

REPORT OF WORK PERFORMED BY THE LAUNCH "AUDREY C." ON THE WATERS OF THE NORTH SHORE OF THE GEORGIAN BAY DURING THE YEAR 1914.

With Overseer Dusang in charge this boat went into commission on April 20th, patrolling to Sturgeon Point, also visiting Midland, Musquash, McCray's Lake, Honey Harbour, and Waubaushene during the rest of the month.

On May 5th Mr. Dusang seized a night line with about 60 hooks and a sturgeon; he also seized a hoop net. The following day he found another night line with 50 hooks, and one trap net with about half a ton of pickerel. On the 7th he found one trap net.

During June he patrolled to Christian Island, Nottawasaga River, Tiny Island, Collingwood, Salt Harbour, Giant Tomb, Parry Sound, Moon River, Quarry Island, Cove Island, Whalens, Honey Harbour, Tomahawk, Coldwater, Fesserton, and Waubaushene. On the 18th he seized a trap net in the vicinity of Giant Tomb.

On July 13th he found two trap nets in the vicinity of Cave Island, which he burned.

During August and September he visited Whalens, Giant Tomb, Salt Harbour, Minnicog, Port Severn, Green Island, Francis, Musquash, McCray's Lake, Honey Harbour, Midland, Christian Island, Severn River, Clear Lake Bay, Moon River, Crawford's, Martin's Isle, and Fesserton. On August 18th he found two trap nets in the vicinity of Christian Island, and on September 9th he found a trap net about 200 yards from Wallace's fish station.

On October 13th he found a trap net in Cape Isle Straits, and the following day patrolled to Wallace's Station, where he found another trap net which he also burned. On the 16th he went to Fesserton, where he got the name of certain men who were shooting ducks from gasoline launches. On the 29th he patrolled to Go Home Bay to see about some Cape Croker Indians hunting deer.

On November 2nd he went to Moose Point, to Wallace's fish station, then to Moon River as far as Crawford's, and the following day he patrolled down to Iron City. During the week beginning November 16th the "Audrey C." was laid up for the winter.

WORK PERFORMED BY LAUNCH "LAURA" IN THE NORTH CHANNEL OF LAKE HURON DURING THE YEAR 1914.

Overseer Kent went to Sault Ste. Marie on June 9th to fetch the "Laura," which had been laid up for repairs, returning home the same night. The remainder of the week he patrolled to Sailors' Encampment, west end of Mud Lake, Hay Point, Hay Marsh, and on Saturday the 13th he was obliged to repair the "Laura's" engine. During the remainder of the month he visited Hay Point, Old Fort, Sterling Bay, Gordon's Creek—where it was reported that a beaver dam was doing damage—Milford Haven, Gowas Bay, and Anderson's Bay.

On July 20th he visited the Soo and spent a night on the "Jessie T.," having previously visited Cornwall Island, Bainsville, Duncan Island, Burnt Island, Brown's Creek, Beef Island, where he visited the fishing station, Big Point, Marksville, Kensington Point, Richard's Landing to Thorn Island and other small islands. The following day on leaving the Soo he made for the head of St. Joseph's Island and found that the tourists had not returned. On the 23rd he visited Richard's Landing and Llewellyn Beach, where he found some Americans angling. He sold a permit and returned home.

On the 7th August he visited Portlock, Richard's Landing, Town Line, Llewellyn Beach, and during the last week of this month he patrolled to Hay Point

and Old Fort, from there to Elliott's Point, Duncan Island, Whiskey Bay the following day, returning home on the 27th. He dragged around some island and found a trap net.

On September 1st he went to Sailors' Encampment, dragged for nets in the bay, and returned home. He also visited Bainsville, Cornwall, Fraser's Point, during this month.

On October 14th he visited Tenby Bay and Milford Haven, and on the 17th he went to the Soo for gasoline. On the 26th he patrolled to A and U line, where some beavers had a large dam on a creek, causing same to flood the road; he then went on to Hay Marsh, returning home the same night.

During the year he seized about 500 yards of gill net, night lines containing about 2,000 hooks, one boat, seven spars, fourteen sturgeon, five jacklights. He found six people fishing illegally, and gave a good many others a warning which stopped them from doing any illegal work.

REPORT OF WORK PERFORMED BY PATROL BOAT "CHRISTINA MAC." ON THE WESTERN PORTION OF LAKE SUPERIOR DURING THE YEAR 1914.

This boat was rented for the season from Mr. John Maloney, of Port Arthur, and was put in the charge of Capt. C. H. Boon.

On May 9th he patrolled to Rossport, and during the remainder of the month he visited Battle Island, Woodbine Harbour, Bead Island, French Harbour, Duncan's Cove, Jack Fish, White Sand River, Wilson's Island (where he found ducks very plentiful), Burnt Harbour, Gravel River, and McKay's Harbour. He found that the fishing was not so good as other years, but ducks seemed to be plentiful.

On June 15th he patrolled two small streams with the row-boat, it having been reported that lime was used to drive fish out of the streams, but he found this to be untrue.

On August 25th, Captain Boon having asked to be relieved, Captain Wright took charge, and on the 26th and 27th patrolled to Port Arthur.

During September he visited Manitou Island, Sawyer's Bay, Silver Isle, Point Magnet, Nepigon Straits, Flower Isle, Lamb Isle, Welcome Isle.

On October 2nd he visited Pie Island with District Warden Young on board. On the 5th he located a gang who had been operating nets in Canadian waters. On the 7th he had one, Andrew Lassilio, fined for fishing without a license on St. Mary's Island. On the 18th he investigated a report of moose being shot in Moffat Straits, but could find nothing.

On November 2nd he seized 600 yards of gill net on the north side of Caribou Island. On the 7th he patrolled to Hyder's Bay, below Green Point, with P. C. Symons on board and brought in two Finlanders who had broken into A. Ficano's net-house at Wild Goose Point and stolen four whitefish and one herring net. He secured three of the four nets and landed the prisoners in Port Arthur, who were fined $25 each. On the 25th, 26th and 27th he reports heavy catches of herring. On the 30th he received a report that a party of American hunters were operating in the vicinity of Black Bay, but he only found a party of surveyors.

On December 7th he made an inventory of everything on the boat and returned her to Captain Maloney.

WORK PERFORMED BY PATROL BOAT "WENONAH" ON THE LAKE OF THE WOODS DURING THE YEAR 1914.

Mr. Sterling began patrol work for the year on May 13th and on the 15th he found two nets in Sioux Narrows which he destroyed. On the 20th he patrolled to Shoal Lake and Snowshoe Bay, then on to Falcon River and paddled three miles up the river. He is of the opinion that this part of his district should be visited frequently, as there will be a great many men working on the Winnipeg line. On the 24th he went to Clearwater Bay to settle a dispute between two licensed fishermen regarding their fishing grounds.

On the 3rd June he seized a net in Keewatin Channel which he destroyed. On the 5th he visited Cyclone Island to investigate a report that some Americans were fishing in Canadian waters. On the 17th he patrolled to Long Lake, having heard a report that the Indians had nets in the lake. He found two which he made them take up. This lake was stocked with black bass some time ago and there was very good fishing in it last summer. He also visited Bishop Point, Hay Island, Blindfold Lake, Snake Bay, Cameron Island, Crow Rock, Cliff Island. Poplar Bay, Horn Lake, Berry Lake, French Portage, Rush Bay, and Kenora.

On August 1st he visited Whitefish Bay, and had some trouble with Indians catching fish and selling them to the fishermen. On the 25th he patrolled to Whitefish Rapids to investigate a report of illegal fishing on Pine Lake. He obtained the name of the man from some Indians who were with him, and returned home via Black Eagle and Sioux Narrows. During September and until the end of the patrol season he visited the above named places as well as Shore Island, Big Stone Bay, Rainy River, Red Water Bay, Black River, Nester Falls, Garden Island, and Grassy River. He investigated many reports of illegal fishing and hunting during the season, some of which proved to be without foundation. On November 18th the boat was laid up for the winter.

WORK PERFORMED BY LAUNCH "MERMAID" IN THE RIDEAU WATERS DURING THE YEAR 1914.

Overseer McGuire, with the aid of his assistant, commenced fitting out patrol boat "Mermaid" on May 15th, taking the engine to Brockville to have it overhauled and put in first-class condition for the season's work. On May 20th he began patrol work by visiting the waters of Whitefish Lake as far as Seeley's Bay, and on the 26th after locking the launch through he patrolled the different lakes of the Rideau Canal as far as Newboro, on the return journey calling at Chaffey's Lock and visiting the Club House there. The boat was working well and he had a successful trip. He kept up the patrol every day until the end of the month with equal success, visiting Brewer's Mills, Opinicon Lake, Sand Lake, Cranberry Lake, where he investigated a report of bass fishing, Dog Lake and Rock Lake. The object he had in view was the protection of the bass during the close season, this he found difficult as the people like to fish.

During the first two weeks of June he visited Brewer's Mills, Dog Lake, Battersea, Chaffey's Lock, Morton, Seeley's Bay, Opinicon Lake, and Sand Lake. On

the 15th the bass season opened and tourists began to flock in. Looking after them and selling angling permits occupied most of his time from now until the end of the season. He went to Elgin to procure warrants for two strangers for catching bass before the season opened. They both pleaded guilty and a fine of $5 each was imposed. More non-residents visited the district for the purpose of angling than in any previous year during the month of June, but later there were not so many.

The angling season opened up in his district on the Rideau in a most encouraging manner, fishing never having been better. A greater percentage of the tourists than ever before were Canadians from Toronto, Montreal, Kingston, etc.

During the remainder of the month of June he patrolled to Cranberry Lake, Brewer's Mills, Opinicon Lake, Sand Lake, Newboro, Seeley's Bay, Whitefish Lake, Morton and Kingston, where he met Captain Fleming, of patrol boat "Navarch."

During July there were not so many tourists as usual, formerly it has been the best month of all, but this year June seemed to be more favourable. He visited the above named places during his patrol service, and on the 10th interviewed the Overseer at Newboro with regard to fishery matters. On the 31st he again visited Newboro, returning by the back channel through Benson and Mosquito Lakes to Chaffey's Lock and then on to Jones' Falls.

August was an ideal month for the tourists. He has never seen them enjoy themselves so well as they did this season. The only complaint he heard of was at Chaffey's Lock, where the bait was said to be of poor quality and sometimes there was a shortage of it. A change will have to be made there another season.

He kept up an almost daily patrol of his district, running into Kingston once a month and as far as Newboro the other way once each week. He also visited Dog Lake and Battersea every week. This constant patrol kept him in touch with the business all along the line of the Rideau Canal from Newboro to Kingston. He disposed of 120 two dollar permits and one five dollar permit during August.

On August 10th he patrolled to the High Banks, River Styx, and returning ran in to Dog Lake.

When September came in, although the weather was fine and the fishing good, the tourists nearly all left for their homes and business was poor. He kept up the patrol work regularly and had a good deal of trouble in the River Styx with people shooting ducks before the season opened. He could not wholly prevent this and he is satisfied that a number of ducks were killed in the close season. He made several trips to this locality and stayed there all night each time. On one occasion he seized a boat and chased some of the illegal workers, but was unable to catch them.

During September he patrolled to Chaffey's Lock, Indian, Clear and Mud Lakes, Newboro, Sand and Opinicon Lakes, Brewer's Mills, Dog Lake, Battersea, Benson and Mosquito Lakes, Whitefish Lake, Cranberry Lake, Morton, River Styx, Seeley's Lake, and Kingston.

When October came in there were only two American tourists in his district, the angling season being almost over. On the 12th of the month his boat was burned and he was obliged to finish the season's patrol work with another boat. He had several reports of illegal shooting of ducks during this month, but was unable to catch anyone. He kept up a constant patrol service of the waters in his district. On the 23rd he visited Newboro and consulted with Overseer Wight with regard to their official duties.

From October 26th-29th he patrolled Loughboro Lake, but on grappling was unable to find any nets, as the salmon had not commenced spawning.

Again on November 2nd he patrolled Loughboro Lake and was out all night. On the night of the 3rd he came upon two men setting a net. The men got away but he was able to seize the boat and net. On the nights of the 11th and 12th he once more patrolled Loughboro Lake but was unable to apprehend any illegal work. Patrol work with the launch was ended on October 18th, the weather being very cold and ice forming on the water.

LIST OF GAME AND FISHERY WARDENS.

Name.	Residence.	District.
Burt, William	Simcoe	Niagara Peninsula
Chauvin, Victor	Windsor	South Western District
McDonald, Donald...	Fort William	Rainy River and Thunder Bay Districts.
Metcalf, J. H.	Kingston	Eastern District.
Parks, G. M.....	North Bay.....	Districts of Nipissing, Sudbury and Temiskaming.
Robinson, J. T.....	Sault Ste. Marie ...	Districts of Algoma and Manitoulin.
Sterling, C. N.	Kenora	District of Kenora.
Willmott, J. H.....	Beaumaris.....	Districts of Muskoka and Parry Sound.
Young, D. D. (Col.)..	Kingston	For the Province.

LIST OF OVERSEERS.

Name.	Residence.	District.
Adair, William	Norland	Townships of Laxton, Digby and Somerville, in the County of Victoria.
Anderson, W. A. ...	Cornwall	Counties of Stormont and Glengarry, with jurisdiction over so much of the River St. Lawrence as lies in front of said counties.
Andrews, Samuel ..	Micksburg ...	For the Tps. of Bromley, Stafford, and Ross, in the County of Renfrew, with joint jurisdiction over the Tp. of Westmeath.
Armstrong, H. C. ..	Glen Ross	The Trent River, from its mouth to Chisholm's Rapids, and tributaries thereto, and to Trenton Junction.
Avery, Melzar	Sharbot Lake	Township of Oso, with joint jurisdiction over the Township of Hinchinbrook, in the County of Frontenac.
Avis, J. J.	Cockburn Island	Cockburn Island, in the District of Manitoulin.
Aymer, William ...	Fort Frances.	Fort Frances, from mouth of Rainy River to Emo and District of Rainy River.
Barr, George	Harrowsmith..	Tp. Portland, in Co. Frontenac, with joint jurisdiction over Desert and Knowlton Lakes.
Beatty, John	Old Fort Midland	With jurisdiction, with other overseers, over Tps. Tay and Matchedash, Co. Simcoe.
Bemrose, John	Claude	In and for the Townships of Chinguacousy, Caledon, and Albion, in the County of Peel.
Birch, W. J.....	Delta	Upper and Lower Beverley lakes and rivers.
Blea, Daniel	South River	Province of Ontario.
Bliss, L. E.	Nepigon	The River Nepigon, Lake Nepigon, and waters tributary to the said river and lake.
Blunden, H. A.	Sarnia	County Lambton, exclusive of Walpole and St. Ann's Islands.
Boate, J. R.	Fowler's Cors.	Tp. Emily, in Co. Victoria.
Boler, William	R. R. No. 2, Lambeth....	River Thames, between London and boundary line between Townships Delaware and Westminster, County of Middlesex.
Bonter, Robert	Marmora	Tp. of Marmora County of Hastings.
Bourgon, J. B.	Rockland	County of Russell.
Boyd, J. H.	Merrickville .	Rideau River and tributaries, fronting on County of Grenville.
Boyd, W. M.	Kagawong ...	Kagawong Lake, with jurisdiction over North Channel, in vicinity of Kagawong Village.
Bradbury, J. R. ...	Blind River ..	District of Algoma.

LIST OF OVERSEERS.—*Continued.*

Name.	Residence.	District.
Bradshaw, A.	Lindsay	Townships Mariposa and Ops. Co, Victoria.
Briggs, George	Bridgeburg ..	County of Welland.
Brisbin, Angus	Picton	For the waters of Lake Ontario, fronting Tps. North and South Marysburg, including all waters surrounding islands in said townships, also Main Duck Islands, and that portion of Bay of Quinte fronting these townships, as well as the waters of the Bay of Quinte, known as Picton Harbor, in Tp. Hallowell.
Briscoe, W L..	Killaloe Stn...	Townships of Jones, Sherwood, Hagarty, Radcliffe, Brudenell, Raglan, and Lynedoch, Co. Renfrew.
Brown, Alex.....	Welland	For the County of Welland.
Brown, R. M.	Milton	Townships of Nassagaweya and Esquesing in the County of Halton.
Burke, George	Perth	For the Town of Perth, Townships of North Elmsley, Drummond, North Burgess, and the first two concessions of the Township of Bathurst, County Lanark.
Burns, D. E.	Pembroke	The waters between Allumette Rapids and Deux Joachim.
Burtcheall, C.	Coboconk ...	Balsam and Mud Turtle Lakes, County Victoria.
Carson, R. W.	Peterboro' ...	Counties Simcoe, Ontario, Victoria, Peterboro,' Durham, Northumberland, and York.
Cassan, C. H.	Campbellford	Trent River and tributaries, Co. Northumberland, from Campbellford to Trent Bridge.
Cates, Geo. S.	Emo	Rainy River District, between Emo and the Town of Rainy River.
Cheer, T. H.	Brighton	For the waters of Lake Ontario, fronting Co. Northumberland, also inland waters tributary to said lake in said county.
Clark, Gordon	Westport	Township of North Crosby, in the County of Leeds, and with joint jurisdiction with any other overseer over Wolf Lake, in said Township, and the Township of Bedford, in County of Frontenac.
Clarkson, William .	Lakehurst ...	West half of Township of Smith, Township of Ennismore, west half of Tp. Harvey, Tps. of Galway and Cavendish, Co. Peterboro.'
Collins, W. E.	Strathroy	Townships of Adelaide, Metcalfe, and with joint jurisdiction over Tp. Caradoc, Co. Middlesex.
Conway, Richard ..	Madawaska ..	Townships of Airy, Murchison, Sabine and Lyell, in the District of Nipissing.
Cook, H. G. A.	Niagara Falls.	County Welland.

LIST OF OVERSEERS.—*Continued.*

Name.	Residence.	District.
Corsant, A.	Masonville ...	County Middlesex, east of boundary line between the Townships of Westminster and Delaware, London and Lobo.
Coulter, Samuel	Gilford	Lake Simcoe, from the 10th concession, Township Innisfail, to the mouth of the Holland River.
Coultis, Chas. L. ...	Leamington .	Tps. Malden, North and South Colchester, North and South Gosfield and Mersea, in the County of Essex, with jurisdiction over so much of the waters of Lake Erie as lie in front of the said Townships, but not for the Detroit River.
Covell, H. N.	Lombardy ...	Township South Elmsley, County Leeds.
Cox, Matthew	Howe Island .	The waters of St. Lawrence River around Howe Island.
Crotty, John	Bothwell	River Thames, between Village of Wardsville and easterly limits of County of Kent, in County of Middlesex.
Dafoe, P. W.	Napanee	Tp. Richmond, with joint jurisdiction over Tp. N. Fredericksburg, and for the waters known as Napanee River, fronting Tps. Richmond and N. Fredericksburg.
Davy, N. W.	Morrisburg ..	For the County of Dundas.
Deacon, Ephraim ..	Bolingbroke..	In and for the Townships of Bathurst and South Sherbrooke, in the County of Lanark, including Christy's Lake, and with joint jurisdiction over the Township of Bedford, in the County of Frontenac.
Devine, John	Renfrew	Townships, Horton, McNab, Admaston, Bagot, Blythfield, Brougham, Griffith, and Matawatchan, in the County of Renfrew.
Donaldson, W. J. ..	Donaldson ...	Townships of Palmerston, Clarendon, Barrie, Miller, North Canonto, and South Canonto, electoral district of Addington.
Drew, Henry	Long Lake ...	Townships Olden and Kennebec, with joint jurisdiction over Hinchinbrooke.
Drouillard, Arsas ..	Walkerville ..	County of Essex.
Duncan, J. G.	Callender	Districts of Parry Sound and Nipissing, with jurisdiction on and over Lake Nipissing.
Dunk, Jno., Sr.	Kearney	Tps. Perry, Bethune, Proudfoot, and Armour, in District of Parry Sound, with jurisdiction over Parry Sound.
Dunnigan, Jerry ...	Castile	For the Township of Algona.
Dupuis, Ferdinand .	Hawkesbury .	County of Prescott.

LIST OF OVERSEERS.—*Continued.*

Name.	Residence.	District.
Dusang, B. A.	Waubaushene.	Tps. of Freeman, Gibson, Baxter, Wood and Morrison, in District of Muskoka, also over Severn River.
Edwards, Herbert .	Nairn Centre	Townships Merritt, Nairn, Lorne, and Baldwin, in the District of Algoma.
Elliott, Robt.	Port Hope ...	Tps. Hope and Cavan, in County Durham, with joint jurisdiction over County of Durham.
Fanning, Geo. H. ..	Sioux Lookout	For that portion of the Kenora District beginning at Quibell and east to the boundary line between the Districts of Kenora and Thunder Bay.
Featherstone, John	Renwick	Townships Romney, East Tilbury and Raleigh, in Co. Kent.
Findley, James	Richmond ...	For the Tp. of Goulburn, the westerly part of Nepean Tp., and that part of the Tp. of Marlborough adjacent to the Tp. of Goulburn.
Fitzsimon, Chas. ...	SaultSte.Marie	The Province of Ontario.
Fleming, E.	Hastings	Village of Hastings.
Fleming, John	Newboro'	Cos. Leeds, Frontenac, Lennox and Addington, Hastings, Prince Edward, Northumberland, Lanark, Carleton, Russel, Prescott, Glengarry, Stormont, Dundas and Grenville.
Floyd, John	Nipissing	For Lake Nipissing in the vicinity of Nipissing Village.
Forsyth, John	Bridgenorth .	The waters of Chemong Lake and Lovesick Lake.
Fox, Eben R.	Northport ...	For that portion of the Bay of Quinte fronting Township Ameliasburg, east of Belleville Bridge, and also Township Sophiasburg, and over all the inland waters within Township Sophiasburg, and with joint jurisdiction, with any other overseer, over all inland waters in Township of Ameliasburg.
Fraser, J. A.	Prescott	St. Lawrence River, from the head of Cardinal Rapids west to Union Park.
Gammond, Fred. ...	Slate River .	Tps. of Neebing, Paipoonge, Pardee, Crooks, Scoble, Blake, Pearson, Gillies, Marks, and Lybster, in the Fort William District.
Gates, George	Kingston	Rideau waters between Kingston Mills and Brewer's Mills, with joint jurisdiction over the Rideau waters between Kingston Mills and the River St. Lawrence.
Gaudaur, C. G.	Atherley	Lake Couchiching and the waters of Lake Simcoe as far as Uptergrove, with joint jurisdiction over Mud Lake, in the County of Ontario.

LIST OF OVERSEERS.—*Continued.*

Name.	Residence.	District.
Gault, T. G.....	Deseronto....	Bay of Quinte, East Riding County of Hastings, and for Moira River and other waters in said riding.
Gillespie, G.	Brechin	Lake Simcoe and tributaries fronting Tp. Mara, in Co. Simcoe.
Gillespie, James ...	Berkeley	Electoral District of Centre Grey and for Township of Glenelg in South Grey.
Gordon, Walter ...	Port Arthur .	In and for the District of Thunder Bay.
Green, Adam	R.R. No. 2, Kinburn	Townships Huntley and Fitzroy, County Carleton.
Green, Geo. G.	Bradford	Holland River, on the north side in Township West Gwillimbury, westward to the forks of the river in County Simcoe.
Gurren, Geo. H. ...	Sandhurst ...	Townships of Ernestown and South Fredericksburg fronting Lake Ontario and the Bay of Quinte, but not Hay Bay, and with joint jurisdiction with any other Overseer or Overseers who have been or may hereafter be appointed over any of the townships fronting those waters in the County of Lennox.
Haggerty, John ...	Gilmour P.O. .	Tps. Grimsthorpe and Cashel, in Co. Hastings, and with joint jurisdiction over Tps. Tudor, Lake, Wollaston, Limerick, Faraday, Dungannon, and Mayo, in said Co.
Hall, Andrew	Gore Bay	West end of Manitoulin Island, including the Tps. of Gordon and Mills, in the District of Manitoulin.
Halward, Chas.	Cannington ..	Beaver River, running through the Townships of Brock and Thorah, and the Village of Sunderland and Cannington, in the County of Ontario.
Hanes, F. A.	Huntsville ...	Townships Stephenson, Stisted, Chaffey, Sinclair, and Brunel, in District of Muskoka.
Hayes, Henry	Murray	Bay of Quinte, as lies in front of the East Riding of Northumberland, for that portion of the River Trent lying between the Townships of Sidney and the Bay of Quinte, and for the inland waters of the Townships of Murray, Dryden, Cramahe and Haldimand.
Hembruff, Jos.	Manitowaning.	Lake Manitou, on Manitoulin Island, and the streams tributary thereto.
Henderson, H. A....	Pelee Island ..	For Pelee Island and the other islands in Lake Erie, south of the county of Essex.
Hess, James	Hastings	Trent River and tributaries in County Northumberland, from Trent Bridge to Rice Lake.

LIST OF OVERSEERS.—*Continued.*

Name.	Residence.	District.
Holliday, Henry ...	Wolfe Island..	Township of Wolfe Island and for the islands of Simcoe, Garden and Horseshoe, and any other islands comprised in the Township of Wolfe Island.
Hood, Geo., Sr.	Scugog	For the Township of Reach, in the County of Ontario, and for the Township of Mariposa, in the County of Victoria, and over so much of the waters of Lake Scugog as lies in front of the said townships, and for the westerly half of Scugog Island, and over the waters of Lake Scugog fronting thereon.
Hornsby, T. J.	Penetang	Tps. Matchedash, Tay, Medonte, Tiny, Flos, Sunnidale, and Nottawasaga, in the County of Simcoe, and over Christian, Bethwick, and Giant's Tomb Island.
Huffman, E. M. ...	Hay Bay	Tps. N. Fredericksburg, Adolphustown, and S. Fredericksburg, fronting on Hay Bay and Bay of Quinte as far as Cole's Point, but not including the Napanee River, in the County of Lennox.
Irish, John E.	Vennachar ...	Tps. of Anglesea, Effingham, Ashley, Denbigh and Abinger, in the County of Addington.
Irwin, David	Little Current	In and for that portion of the District of Algoma lying east of the Village of Algoma Mills, and for Cockburn and Manitoulin Islands, and in and over the waters that lie in front of the said District and which surround the said islands, and with joint jurisdiction with any other overseer who has been or may hereafter be appointed.
Irwin, J. J.	Dalrymple ...	Township Carden, in County Victoria, with jurisdiction over Mud Lake, in County Victoria.
Jackson, W. W. ...	St. George ...	South Dumfries, lying south of the Grand River, in the County of Brant.
Jermyn, J. W.	Wiarton	Georgian Bay, County of Bruce, lying east and south of Tobermory Harbor, but exclusive of the said Harbor.
Jewell, V. J.	Batchawana .	Lake Superior, in the vicinity of Batchawana.
Jickling, Chas.	St. Paul's Stn..	County Perth and for Townships East Nissouri and East and West Zorra, in County Oxford.
Johnson, Henry ...	Brantford	That part of Grand River lying between the southerly boundary of Town of Galt and the boundary line between Tuscarora and Onondaga Townships in County Brant and the Townships of Seneca and Oneida in Haldimand County; also concurrent jurisdiction with Overseer Kern over tributaries to the Grand River in Burford, Oakland, and Brantford Townships west of Grand River.

LIST OF OVERSEERS.—*Continued.*

Name.	Residence.	District.
Johnston, James....	Orangeville ..	Townships of Caledon and Albion, in the County of Peel.
Johnston, Thos. H. ..	Royston	Townships of Lount, Machar, Laurier, Croft, Chapman, Strong, Jolly, Spence, Ryerson, Armour, Proudfoot, Monteith, McMurrich, Perry and Bethune, District of Parry Sound.
Johnston, W. H. ...	Harwood	Rice Lake, in the Townships of Hamilton and Alnwick, County Northumberland.
Jones, John	Fenelon Falls	For the north end of Sturgeon Lake, and Cameron Lake to Rosedale Locks, Burnt River and Rosedale River, in the County of Victoria.
Kehoe, D.	Millarton	That portion of County Bruce lying south of Indian Reserve and Township of Amabel, with jurisdiction over Lake Huron in front of said county, south of Southampton.
Kennedy, J. A.	Tichborne	Eagle Lake, in the Townships of Hinchinbrooke and Bedford, and with joint jurisdiction over the Township of Bedford, in the County of Frontenac.
Kent, A. J.	Bewdley	Rice Lake, from Ley's Point on the south shore of said lake around the head of lake to Barnard's Bay on the north shore of Rice Lake.
Kent, Percy	Kentvale	For the whole of St. Joseph's Island.
Kern, Jacob	Burford	County of Brant, comprising Townships of Burford, Oakland and Brantford, west of Grand River, but exclusive of said river.
Kerr, C. J.	Hamilton	County of Wentworth.
Laframboise, Remi..	Canard River	Detroit River, fronting Townships of Sandwich, West Anderdon and Malden, and also Canadian islands in said river, County Essex.
Lake, Atchinson.....	Inverary	Tp. Storrington, including Rideau waters from Brewer's Mills to south limit of the Township. with jurisdiction over all of Loughboro Lake and the Lakes in the Township of Storrington.
Lambkin, Richard...	Loring	Townships of Harrison, Burton, McKenzie, Ferrie, Wallbridge, Brown, Wilson, Mills, Pringle, Gurd, Himsworth, Nipissing, Patterson, Hardy, McConkey, Blair, and Mowat, in the District of Parry Sound.
Lane, James E.	Wellington ...	For the waters of Lake Ontario fronting the Tps. of Hallowell and Athol, also for the Village of Wellington, in the Tp. of Hillier, and for the inland lakes and streams in the said Tps. of Hallowell and Athol.

LIST OF OVERSEERS.—*Continued.*

Name.	Residence.	District.
Laughlin, J. H.	New Lowell ..	Townships of Nottawasaga, Sunnidale and Flos, in County Simcoe, with joint jurisdiction over the Township of Vespra in said county.
Leadley, Robt.	Barrie	For the Township of Vespra and the Town of Barrie, in the County of Simcoe, and over so much of the waters of Kempenfeldt Bay as lies in front of the said town and township; also, that portion of Kempenfeldt Bay lying in front of the Township of Oro.
Lean, Wellington ..	Apsley	Townships of Anstruther and Chandos, County of Peterboro.
Lee, James W.	Wellandport ..	In and for the Townships of Moulton, Sherbrooke and Wainfleet, in the Electoral District of Monck, with jurisdiction over so much of the waters of Lake Erie as lies in front of said townships.
Lewis, James	Sheguiandah ..	North Channel of Lake Huron, from the Soo to the Bustards.
Little, Richard	Wallaceburg .	County of Kent, fronting on Lake St. Clair, exclusive of Dover West Township, also Walpole and Ste. Annes Islands, County Lambton.
Lockman, E. W. ...	Dorset	Tps. Maclean, Ridout, Franklin and Brunel, in the District of Muskoka, and Tps. of McClintock, Livingstone, Sherbourne and Havelock, in the District of Haliburton.
Loveday, E. T.	Ottawa	In and for the Townships of Nepean, Gloucester, North Gower and Osgoode, in the County of Carleton, with jurisdiction over so much of the River Ottawa and the River Rideau and the Rideau Canal as lies in front or within said Townships, and over the tributaries to the said rivers and canals.
McAllister, J. R. ...	Gore's Landing	Rice Lake, between Jubilee Point, and Lower Close's Point and the waters tributary thereto, in the Townships of Hamilton and Alnwick, County of Northumberland.
McArthur, John	Ice Lake	Tp. of Allan, in the District of Manitoulin.
McCaw, James	Bancroft	Townships Faraday, Dungannon and Herschell, in the County of Hastings.
McClennan, Kenneth.	Aylmer	Townships of Yarmouth, Malahide and Bayham, with jurisdiction over so much of the waters of Lake Erie as lies in front of the said township and the tributaries thereto.
McDonald, Hector...	Beaverton ...	Waters of Lake Simcoe and tributaries thereto fronting the Tp. of Thorah, in the County of Ontario.

LIST OF OVERSEERS.—*Continued.*

Name.	Residence.	District.
McFarlane, J. S. ...	Keene	Townships Otonabee and Asphodel, in Co. Peterboro, with jurisdiction over so much of Rice Lake as lies in front of said townships, and joint jurisdiction over said Lake.
McGinn, Wm.	Orillia	Townships of Orillia and Oro, in the County of Simcoe, and over so much of Shingle and Carthews Bays and Lakes Couchiching and Simcoe as lies in front of said townships, and over River Severn.
McGowan, John	Tweed	For the Townships of Hungerford and Huntingdon, in the County of Hastings.
McGuire, J.	Jones Falls ..	Rideau River, fronting on the Township of South Crosby, County of Leeds, with jurisdiction as far as Kingston Mills, and also over Crippen Lake, in Leeds Township.
McKenny, Thos.	Thornbury ...	Co. Grey, exclusive of the Tps. of Proton, Egremont and Normanby, with jurisdiction over so much of the waters of the Georgian Bay as lies in front of said county.
McMurray, R.	Bayfield	County of Huron.
McPhee, D.	Uptergrove ...	Lake Simcoe, fronting on Township of Mara and the tributaries thereto, and for Mud Lake in the Townships of Mara and Carden.
McVittie, James ...	Blenheim	Townships Orford, Howard and Harwich, Co. Kent.
Major, William	Woodlawn ...	Townships of March and Torbolton, County Carleton.
Mansfield, Thomas .	Pickering	Electoral District of South Ontario, exclusive of the Township of Reach.
Marsh, Thomas	Collins Bay ..	For the Township of Kingston in the County of Frontenac.
May, J. C.	St. Catharines	County of Lincoln and over so much of the waters of Lake Ontario as lies in front of the said county, and with jurisdiction over the Niagara River between its mouth and the Falls.
Maybee, Manly	Cameron P.O..	Sturgeon Lake, beginning at Day's Landing and running south for five miles, including McLaren's Creek, Sturgeon Point and Pleasant Point in Co. Haliburton.
Mayor, Harry	Painswick	Lake Simcoe, from Lovers' Creek, near Barrie, on Kempenfeldt Bay, to concession 10 of the Township of Innisfil.
Melville, Henry	Havelock	Townships of Belmont and Bethuen, County Peterborough.

LIST OF OVERSEERS.—*Continued.*

Name.	Residence.	District.
Meneilly, F. H.	Warkworth ..	River Trent and tributaries, in Co. Northumberland, from Percy Boom to Campbellford Bridge.
Moffatt, George	Glencross	Townships of Mulmur, Mono and East Garafraxa.
Moore, F. J.	Lakefield	Townships of Douro, Dummer, east part of Smith, Tp. of Burleigh and east half of Harvey, Co. Peterboro.'
Moore, James A.....	Trenton	That portion of Co. Hastings fronting Bay of Quinte from City of Belleville west to the Trent River as far as Trenton Junction, with joint jurisdictions over the waters of the Bay of Quinte between bridge at Belleville and Murray Canal and also Weller's Bay.
Morton, John	St. Ola	Townships Limerick, Tudor, Wollaston, Cashel Lake and Grimsthorpe, County Hastings.
Muncer, W. G.	Minaki	For that portion of the Kenora District between Quibell and the boundary line between the Province of Ontario and the Province of Manitoba.
Myers, James	Holstein	Townships of Proton, Egremont and Normanby, County Grey, and Townships Minto, Arthur and West Luther, County Wellington.
Parker, H. B.	Bobcaygeon ..	In and for the Township of Verulam, in the County of Victoria and the Tp. of Harvey, in the County of Peterboro.'
Parkin, C. W.	Valentia	Townships Mariposa and Ops, County Victoria.
Patterson, Archibald.	Bothwell	For that portion of the River Thames lying between the Village of Louisville and the easterly limits of Kent County, with jurisdiction over any waters flowing into the Thames between the aforesaid limits, in the County of Ken.
Patterson, S.	Dunkerron ..	Holland River known as the north and west branches in Tps. Tecumseh, and West Gwillimbury, in Co. Simcoe.
Peltier, George	Dover South .	River Thames from Lewisville to its mouth, also the tributaries of said river between these points; also the Township of Dover West, County Kent.
Pepper, Wm.	Lanark	Townships Drummond, Lanark, Darling, and Lavant, in Co. Lanark, with joint jurisdiction over waters in Tp. Drummond.
Phillips, J. H.....	Smith's Falls.	County Frontenac lying north of the Townships of Kingston and Pittsburg, the Townships of North and South Crosby, Bastard, South Elmsley and Kitley, County of Leeds, and the County of Lanark.

LIST OF OVERSEERS.—*Continued.*

Name	Residence.	District.
Pickell, S. G.	Oshawa	Co. Durham, with jurisdiction over so much of the waters of Lake Ontario as lies in front of said county.
Purcell, H. R.	Colebrook	Townships Camden and Sheffield, the County Addington.
Pyette, David	Tehkumah ...	Manitoulin Island, in Lake Huron.
Ramesbottom, John	Little Current	District of Manitoulin.
Reid, H. W.	Parry Sound .	Townships Shawanaga, Ferguson, Carling, McDougall, McKellar, Christie, Foley, Parry Island, Cowper, and Conger.
Rivet, Jos.	Sturgeon Falls	That portion of the District of Nipissing lying west and north of the Townships of Widdifield, Merrick, Stewart and Osborne, exclusive of Lake Timiskaming and its tributaries.
Robertson, C.	Hillsburg	Townships of Erin and West Garafraxa, County of Wellington.
Robinson, T. W. ...	Collingwood ..	Townships Collingwood and Osprey, County of Grey, and the Townships of Nottawasaga and Sunnidale, County of Simcoe.
Robinson, Wm.	Kilworthy ...	Severn River and Sparrow Lake.
Sargent, W. J.	Bronte	County of Halton.
Sattler, Louis	Berlin	For the Township of Waterloo.
Scherer, Edwin F...	New Hamburg.	Township of Wilmot, in the County of Waterloo.
Schliehauf, Albert .	Rodney	Townships of Southwold, Dunwich and Aldborough, exclusive of the River Thames, with jurisdiction over so much of Lake Erie as lies in front of the said townships and tributaries thereto, in the County of Elgin.
Senecal, John	Stormont	The counties and waters fronting the Counties of Stormont and Glengarry in the Province of Ontario, and with joint jurisdiction with any other Overseer or Overseers in the County of Dundas, in the Province of Ontario.
Shearer, Amos	Roseneath	That portion of Rice Lake in the Townships of Hamilton and Alnwick, between Rock Island and Webb's Landing, with waters tributary thereto.
Slate, Geo.	Rockport	River St. Lawrence between Jackstraw Light and Mallorytown Landing.
Small, John	Grand Valley.	Townships of Melancthon, Amaranth and East Luther, County Dufferin.
Smith, J. S.	Port Rowan ..	For the County of Norfolk.

LIST OF OVERSEERS.—*Continued.*

Name	Residence.	District.
Smith, William	Gravenhurst ..	Lakes Muskoka, Rosseau and Joseph, in the Districts of Parry Sound and Muskoka.
Spence, William ...	Athens.....	Charlestown Lake and its tributaries, County Leeds.
Stanzel, Fred.	Carleton Place.	Townships Beckwith, Drummond, Ramsay and Pakenham in County Lanark, and Townships Fitzroy, Huntley and Goulbourn in County Carleton, with joint jurisdiction over the waters of the Township Drummond with any other overseer.
St. Charles, C.	Madoc	Townships Madoc and Huntingdon, County Hastings.
Stewart, Jas. H. ..	Brockville	Townships of Elizabethtown and the front of Escott and Yonge, in the County of Leeds.
Stuart, D.	Codrington ..	Trent River and tributaries, County of Northumberland, from Chisholm's Rapids to Percy Boom.
Tarry, A. E.	Toronto	Townships of Etobicoke, York and Scarboro, and for the City of Toronto, in the County of York, with jurisdiction over the inland waters of said townships, and also over Toronto and Ashbridge's Bays, and so much of the waters of Lake Ontario as lies in front of the County of York.
Taylor, Oliver	Niagara-on-the-Lake	Niagara River, between Niagara Falls and the mouth of the river.
Temple, Jas. M. ...	Dorchester Stn	Thames River, easterly to boundary line between Oxford and Middlesex, and joint jurisdiction over Oxford.
Thompson, W. H. ..	Bailieboro ...	The Otonabee River, from Bensfort Bridge to Rice Lake.
Tillett, R.	Roach's Point.	North York, with jurisdiction over Holland River and that portion of Lake Simcoe lying in front of North Gwillimbury and Georgina Townships.
Timlin, M.	Atherley	Lake Couchiching and tributaries fronting Townships Mara and Rama.
Titus, E. A.	Wellington ...	For that portion of the Bay of Quinte fronting on Tp. Ameliasburg lying west of Belleville Bridge, also for the waters of Lake Ontario fronting on Tps. Ameliasburg and Hillier, with the exception of Village of Wellington, and including Weller's Bay, Consecon Lake, and all inland waters in said townships.
Toner, George	Gananoque ..	River St. Lawrence, from head of Howe Island to Union Park, and with joint jurisdiction with any other overseer or overseers over the Gananoque River from Gananoque to Marble Rock.

LIST OF OVERSEERS.—*Continued.*

Name	Residence.	District.
Toole, Ira	Omemee	Township of Emily, County of Victoria.
Townsend, J.	Long Point ..	Lyndhurst waters south of Lyndhurst; also South and Gananoque Lakes.
Traves, J. A., Sr. ..	Fraserburg ...	For the District of Muskoka, with joint jurisdiction with any Game and Fisheries overseers who have been or may be appointed over the District of Parry Sound.
Trelford, John	Southampton .	That portion of the County of Bruce fronting on Lake Huron, and lying between the Town of Southampton and Tobermory Harbor, both inclusive.
Truelove, Wm.	Fermoy	The waters in the Tp. of Bedford, in County Frontenac.
Twamley, C.	Cavan	Townships Cavan and Manvers, Co. Durham.
Vokes, James	Nanticoke	For the Townships Walpole, Rainham, South Cayuga, and Dunn, in Co. Haldimand, and the waters of the Grand River, fronting the Townships of Oneida, Seneca, S. Cayuga, N. Cayuga, Canborough, and Dunn.
Walker, R. J.	Port Credit ..	Lake Ontario, fronting County Peel, and for Rivers Credit and Etobicoke, tributary to said lake.
Watson, Hy.	Toronto	Province of Ontario.
Watson, J.	Cæsarea	Townships of Cartwright and Manvers, the waters of Lake Scugog, fronting on said townships and the waters tributary to said lake.
Watt, John	Peterboro	For that portion of the River Otonabee and tributaries between Lakefield and Bensfort Bridge.
Watts, Murdock.....	Byng Inlet ...	River Magnetawan and for the waters of the Georgian Bay lying between the said river and French River.
West, Charles	Holland Ldg..	Joint jurisdiction along the east bank of the Holland River, through the Township of East Gwillimbury and along the shore of Lake Simcoe, through Township of North Gwillimbury, in the County of York.
West, Geo. W.	Holland Ldg..	With joint jurisdiction along east bank of Holland River, through Township of Gwillimbury, and along the shore of Lake Simcoe, through Township of North Gwillimbury, in the County of York.
Wight, J. R.	Newboro	Rideau waters, between Chaffeys Lock and Newboro, including Indian Benson, Mosquito, Clear, Mud and Loon Lakes, and also the Upper Rideau, with jurisdiction over the inland lakes and streams between these two points in the vicinity of the Rideau waters.

LIST OF OVERSEERS.—*Continued.*

Name	Residence.	District.
Wilson, A. H. G. ...	Eganville	Townships S. Algona, N. Algona, Wilberforce, Grattan, and Sebastopol, in Co. Renfrew.
Wilson, H.	Elphin	Townships of Dalhousie and North Sherbrooke, County of Lanark.
Wootton, E. A.	Maynooth	Townships of Bangor, Wicklow and McClure, in County Hastings.
Wormworth, F. L. .	Arden	Townships Kennebec and Barrie, Co. Frontenac.
Young, William	Cloyne	Tps. of Kaladar and Barrie, in the County of Addington, and with joint jurisdiction over the Townships of Anglesea and Effingham.

STATEMENT of Revenue received from Game and Fisheries during the year ended October 31st, 1914.

GAME.	$ c.	$ c.
Trappers' Licenses	300 25	
Non-Resident Licenses	7,400 00	
Resident Deer	24,961 73	
Resident Moose	6,250 00	
Game Dealers	1,158 20	
Hotel and Restaurant	244 00	
Cold Storage	100 00	
Guides	1,486 00	
Fines	6,034 44	
Sales	2,772 49	
		50,707 11

FISHERIES.

District.	Name of Overseer.	Amount.	Total.
		$ c.	$ c.
Kenora and Rainy River District	Aymer, William	878 00	
	Muncer, W. G.	382 00	
	Sterling, C. N.	2,349 00	
	Young, D. D., Col.	128 00	
			3,737 00
River Nepigon	Bliss, L. E.....	1,005 00	
			1,005 00
Lake Superior	Armstrong, H. C.	4 00	
	Armstrong, F. C.	20 00	
	Boon, Chas.	2 00	
	Jewell, V. J.	50 00	
	Gordon, Walter H.	1,933 62	
	Robinson, J. T.	1,942 00	
	Wright, Samuel	10 00	
			3,961 62
Lake Huron (North Channel)	Boyd, William	116 00	
	Bradbury, J. R.	2,917 00	
	Hall, A.	6 00	
	Hembruff, Jos.	94 00	
	Irwin, David	7,027 00	
	Ramesbottom, John	677 00	
			10,837 00
Georgian Bay	Dusang, B. A.	863 25	
	Hornsby, T. H.	195 05	
	Jermyn, J. W.	1,118 60	
	Lamorandiere, P. R. ...	8 00	
	McKenny, Thos.	1,099 50	
	Newell, Chas. E.	4 00	
	Oldfield, Miss E.	44 00	
	Reid, H. W.	1,640 50	
	Robinson, T. W.	532 00	
	Watts, Murdoch	702 00	
	Wood, P. V.	72 00	
			6,278 90
Lake Huron (proper) and River St. Clair	Blunden, H. A.	3,199 00	
	Gildersleeve, H. H.	18 75	
	Karr, Richard	56 00	
	Kehoe, D.	234 80	
	McMurray, Robt.....	566 00	
	Trelford, John	1,347 00	
			5,421 55
	Carried forward ..		31,241 07

STATEMENT of Revenue received—Concluded.

District.	Name of Overseer.	Amount.	Total.
		$ c.	$
	Brought forward .	.....	31,241 07
Lake St. Clair, River Thames and Detroit River	Campbell, J. D.	43 00	
	Chauvin, Victor	2,355 30	
	Crotty, John	12 00	
	Laframboise, Remi	414 00	
	Little, Richard	1,787 50	
	Peltier, George	717 50	
			5,329 30
Lake Erie, Grand River and Niagara River	Briggs, George	1,609 00	
	Brown, Alex.	28 00	
	Buckley, G. E.	192 00	
	Burt, Dr. Wm.	20 00	
	Featherstone, John	4,770 25	
	Greenwood, T. D.	82 00	
	Hawkins, George	2 00	
	Harrison, L. S.	10 00	
	Henderson, H. A.	2,633 00	
	Johnson, Henry	40 00	
	Lee, J. W.	1,063 00	
	McClennan, K.	5,562 00	
	McVittie, Jas.	4,110 00	
	Patterson, G. M.	32 00	
	Phemister, George	682 00	
	Schliehauf, A. C.	3,775 00	
	Scott, William	10,191 00	
	Smith, J. S.	4,796 00	
	Vokes, Jas.	4,212 00	
			43,809 25
Lake Ontario and Bay of Quinte	Beer, G. S.	96 00	
	Brisbin, Angus	751 00	
	Cheer, Thos.	344 00	
	Conger, David	361 00	
	Dafoe, P. W.	208 00	
	Elliott, Robert	25 00	
	Fox, E. R.	763 00	
	Gault, Thos.	763 00	
	Grundy, E. W.	48 00	
	Hayes, H. W.	237 00	
	Higginbottom, F. V.....	138 00	
	Holliday, Henry	762 00	
	Jenney, C. E.	68 00	
	Kerr, C. J.	387 18	
	May, J. C.	578 00	
	Mansfield, Thos.	62 00	
	Moore, Jas. A.....	262 00	
	Morgan, H. M.	208 00	
	Pickell, S. G.	13 00	
	Purser, M. W. G.	12 00	
	Radcliffe, J. H.	68 00	
	Reeves, H. J.	172 00	
	Sargant, William	404 00	
	Tarry, A. E.	309 00	
	Taylor, Oliver	20 00	
	Titus, E. A.	480 00	
	Walker, R. J.	75 00	
			7,614 18
Counties Addington, Carleton, Frontenac, Grenville, Lanark, Leeds, Lennox, Prescott, Renfrew and Russell	Angrove, James	218 00	
	Avery, Melzar	105 00	
	Barr, George	47 00	
	Birch, W. J.	71 00	
	Carried forward ..	.....	.....
			87,993 80

STATEMENT of Revenue received—Continued.

District.	Name of Overseer.	Amount.	Total.
		$ c.	$ c.
	Brought forward .		87,993 80
Counties Addington, etc.—Continued.....	Bourgon, J. B.	52 00	
	Briscoe, W. L.	20 00	
	Burke, George	25 00	
	Burns, D.	6 00	
	Clark, Gordon	40 00	
	Clark, George T.	30 00	
	Davis, J. W.	39 47	
	Deacon, E.	13 00	
	Dupuis, F.	61 00	
	Devine, John	2 00	
	Donaldson, W. J.	2 00	
	Drew, Henry	21 00	
	Gates, George	223 00	
	Kennedy, J. A.	185 00	
	Loveday, E. T.	39 00	
	Lake, Atchinson	252 00	
	Metcalfe, J. H.	8 13	
	Marsh, Thos.	21 00	
	McGuire, John	839 00	
	Pepper, William	25 00	
	Phillips, J. H.	412 65	
	Purcell, H. R.	14 00	
	Stewart, J. H.	10 00	
	Spence, William	184 00	
	Townsend, James	338 00	
	Truelove, Wm.	88 00	
	Toner, George	115 50	
	Van Luven, L.	240 00	
	Wartman, H. E.	40 00	
	Wight, J. R.	380 00	
	Wormwith, F. L.	16 00	
	Young, Wm.	24 00	
			4,206 75
Northumberland, Peterboro, Victoria and other inland Counties	Adair, William	4 00	
	Blea, Daniel	6 00	
	Bonter, Robert	17 00	
	Boyd, J. H.	46 00	
	Bradshaw, A.	4 00	
	Burtcheall, C.	38 00	
	Bennett, E. C.	36 00	
	Carson, R. W.	114 00	
	Cassan, C. H.	68 00	
	Clarkson, Wm.	280 00	
	Crump, C. J. C.	42 00	
	Dodds, W. S.	16 00	
	Doolan, J. T.	8 00	
	Dunk, John	2 00	
	Edwards, Herbert	6 00	
	Fenton, M. H.	180 00	
	Forsythe, J. H.	27 00	
	Fraser, J. A.	10 00	
	Gurren, Geo. H.	903 15	
	Goldie, W. D.	10 00	
	Green, P. J.	30 00	
	Haggerty, John	22 00	
	Hanes, F. A.	73 50	
	Hess, J. H.	4 00	
	Hunter, Capt. A.	155 00	
	Huffman, E. M.....	1,134 00	
	Carried forward ..		92,200 55

STATEMENT of Revenue received—Continued.

District.	Name of Overseer.	Amount.	Total.
		$ c.	$ c.
	Brought forward .		92,200 55
Northumberland, etc.—Continued	Irwin, J. J.	10 00	
	Johnson, W. H.	162 00	
	Johnson, Thos.	73 00	
	Jones, John	12 50	
	Keller, Rod.	42 00	
	Kent, A. J.	16 00	
	Kearns, W. S.	970 00	
	Killen, William	24 00	
	Lambkin, Richard	16 00	
	Lockman, E. W.	140 00	
	McFarlane, John	4 00	
	McAllister, J. R.	90 00	
	Melville, Henry	6 00	
	Moore, F. J.	502 00	
	Morton, J. W.	42 00	
	Parkin, C. W.	4 00	
	Parker, H. B.	462 00	
	Pomoroy, W. H.	12 00	
	Rice, M. A.	4 00	
	Sattler, Louis	6 00	
	Smith, Wm.	180 00	
	Stinson, F. S.	94 00	
	Thompson, W. H.	14 00	
	Toole, Ira	11 00	
	Watt, John	183 00	
	Widdup, J.	18 00	
	Weldon, Jas. O.	176 00	
	Willmott, J. H.	112 00	
	Wootton, E. A.	6 00	
	Yates, Wm.	10 00	
			6,637 15
River St. Lawrence	Anderson, Wm.	6 00	
	Senecal, John	39 00	
			45 00
Lakes Couchiching, Simcoe and Sparrow	Coulter, Samuel	128 00	
	Gaudaur, C. G.	32 00	
	Green, Geo. G.	25 00	
	Gillespie, Gilbert	12 00	
	Leadley, Robt.	14 00	
	Mayor, Harry	6 00	
	McDonald, H.	100 00	
	McPhee, D.	28 00	
	McGinn, Wm.	38 00	
	Robinson, Wm.	356 00	
	Tillett, Robt.	136 00	
	West, G. W.	50 00	
			925 00
Nipissing	Duncan, J. G.	6 00	
	Elder W. A.	24 00	
	Hindson, C. E.	646 00	
	Kent, Percy	18 00	
	Parks, G. M.	337 00	
	Rivet, Jos.	16 00	
	Woods, H. G.	432 00	
	Reid, R.	28 00	
			1,507 00
			.....
Rondeau Provincial Park			$1,889 21
Unclassified			925 71
			$104,129 62

WATERS STOCKED FROM 1901 TO 1913, WITH THE NUMBER AND KINDS OF FISH PLANTED IN EACH.

1901.

Waters stocked.	Species.	Number.
Muskoka Lake	Bass	1,205
Lake Rosseau	Bass	700
Lake Joseph	Bass	1,052
Fairy and Vernon Lakes	Bass	244
Lake of Bays	Bass	693
Thames River at Ingersoll	Bass	225
Thames River at Woodstock	Bass	225
Bear Creek at Strathroy	Bass	396
Thames River at Dorchester	Bass	696
Lake Couchiching	Bass	436
Stoney Lake	Bass	751
Lake Simcoe at Jackson's Point	Bass	603
Holland River	Bass	387
Golden Lake	Bass	372
Severn River	Bass	526
Grand River at Cayuga	Bass	400
Grand River at Brantford	Bass	274
Kempenfeldt Bay	Bass	300
		9,841

1902.

Waters stocked.	Species.	Number.
Muskoka Lake	Bass	246
Lake Joseph	Bass	256
Lake Rosseau	Bass	227
Lake Couchiching	Bass	285
Bear Creek at Strathroy	Bass	395
Stoney Lake	Bass	330
Huntsville Lakes	Bass	265
Winnipeg River	Brook Trout	55
		2,059

1903.

Waters stocked.	Species.	Number.
Bear Creek at Strathroy	Bass	926
Lake Rosseau	Bass	1,130
Lake Joseph	Bass	500
Muskoka Lake	Bass	1,002
Lake of Bays	Bass	371
Sparrow Lake	Bass	650
Lake Couchiching	Bass	258
Long Lake at Rat Portage	Bass	460
Golden Lake	Bass	100
Mink Lake	Bass	85
Clear Lake	Bass	85
White Lake	Bass	100
Lynn River at Lake Simcoe	Bass	355
Grand River at Brantford	Bass	425

WATERS STOCKED FROM 1901 TO 1913, WITH THE NUMBER AND KINDS OF FISH PLANTED IN EACH.—Continued.

1903—Continued.

Waters stocked.	Species.		Number.
Thames River at Ingersoll	Bass		75
Thames River at London	Bass		200
Thames River at St. Mary's	Bass		205
Grand River at Fergus	Bass		100
Grand River at Grand Valley	Bass		70
Grand River at Paris	Bass		130
Musselman's Lake	Bass		200
Lake of Bays	Bass		500
			7,927

1904.

Waters stocked.	Species.		Number.
Credit River	Bass		115
Lake Rosseau	Bass		380
Green Lake	Bass		135
Opinicon Forks	Bass		50
Lake near Barry's Bay	Bass		30
Barry's Bay	Bass		100
Gorman Lake	Bass		75
Golden Lake	Bass		565
Mink Lake	Bass		60
White Lake	Bass		160
Clear Lake	Bass		50
Snell's Lake	Bass		100
Lake Joseph	Bass		725
Bass Lake	Bass		200
Lake Couchiching	Bass		230
Lake Joseph	Bass		415
Lake of Bays	Bass		530
Lake Simcoe at Jackson's Point	Bass		785
Beaver River at Cannington	Bass		250
Balsam Lake	Bass		400
Lake of Bays	Bass	Fingerlings	5,000
Oxbow River at Komoka	Bass	Fingerlings	1,200
Lake Scugog	Bass	Fingerlings	1,400
			12,955

1905.

Waters stocked.	Species.		Number.
Lake Scugog	Bass		400
Stoney Lake	Bass		600
Muskoka Lake	Bass		500
Thames River at Stratford	Bass		250
Thames River at Mitchell	Bass		350
Lake Couchiching	Bass		500
Gull Lake (near Gravenhurst)	Bass		100
Lake of Bays	Bass		400
			3,100

WATERS STOCKED FROM 1901 TO 1913, WITH THE NUMBER AND KINDS OF FISH PLANTED IN EACH.—Continued.

1906.

Waters stocked.	Species.	Number.
Lake Simcoe	Bass	450
Lake of Bays	Bass	700
Gull River	Bass	610
Grand River	Bass	575
Lake Scugog	Bass	400
Muskoka Lake	Bass	700
River Nith	Bass	600
Lake Simcoe	Bass	700
Lake Simcoe	Bass	700
		5,435

1908.

Waters stocked.	Species.	Number.
Sparrow Lake	Bass	500
Haliburton Lake	Bass	520
Puslinch Lake	Bass Fingerlings	725
River vicinity Kenora	Trout, Speckled, fry	2,000
		3,745

1909.

Waters stocked.	Species.	Number.
Mohawk Lake	Bass Fingerlings	1,000
Lake Rosseau	Bass Fingerlings	1,500
Lake Muskoka	Bass Fingerlings	1,500
Lake Joseph	Bass Fingerlings	2,000
Lake of Bays	Bass Fingerlings	2,000
Stoney Lake	Bass Fingerlings	3,500
Gull Lake	Bass Fingerlings	200
Whiteman's Creek	Bass Fingerlings	200
Cooley's Pond	Bass Fingerlings	150
Sparrow Lake	Bass Fingerlings	2,500
		14,550

1910.

Waters stocked.	Species.	Number.
Rideau waters (near Merrickville)	Bass Fingerlings	3,000
Lake Rosseau	Bass Fingerlings	3,000
Lake Joseph	Bass Fingerlings	3,000
Lake Muskoka	Bass Fingerlings	4,000
Gull Lake	Bass Fingerlings	100
Sturgeon Lake	Bass Fingerlings	4,000
Cameron Lake	Bass Fingerlings	3,000
Pigeon Lake	Bass Fingerlings	3,000
Fairy Lake and vicinity of Huntsville	Bass Fingerlings	8,500
Victoria Lake	Bass Fingerlings	2,000
Grand River (at Brantford)	Bass Fingerlings	300
Clear Lake	Bass Fingerlings	2,000
Long Lake (vicinity of Utterson)	Bass Fingerlings	1,725
Grand River (at Brantford)	Parent Bass	50
Oakland Pond	Parent Bass	25
	Total Bass Fingerlings	37,625
	Total Parent Bass	75
	Grand Total	37,700

WATERS STOCKED FROM 1901 TO 1913, WITH THE NUMBER AND KINDS OF FISH PLANTED IN EACH.—Continued.

1911.

Waters stocked.	Species.		Number.
Lake of Bays	Bass	Fingerlings	12,000
Lake Rosseau	Bass	Fingerlings	20,000
Lake Joseph	Bass	Fingerlings	20,000
Wagner Lake	Bass	Fingerlings	2,500
Gull Lake	Bass	Fingerlings	3,000
Fairy Lake	Bass	Fingerlings	5,000
Peninsula Lake	Bass	Fingerlings	5,000
Maitland River at Brussels	Bass	Fingerlings	2,000
Stoney Lake and Big Cedar Lake	Bass	Fingerlings	10,000
Sand Lake	Bass	Fingerlings	3,000
Trout Lake	Bass	Fingerlings	7,000
Grand River at Brantford	Bass	Fingerlings	500
Oakland Pond	Bass	Fingerlings	200
			90,200

WATERS STOCKED FROM 1901 TO 1914, WITH THE NUMBER AND KINDS OF FISH PLANTED IN EACH.—Continued.

Waters Stocked and Location.	Species.	Number.
Boyse Lake, District of Nipissing	Advance Bass Fry	15,000
Net Lake, " "	" "	10,000
Rib Lake, " "	" "	10,000
Waters in the vicinity of Thornbury, Grey County	" "	6,000
Pigeon Lake, Peterboro' County	" "	25,000
Sturgeon Lake, Victoria County	" "	25,000
Wilno Lake, Renfrew County	" "	25,000
Round Lake, " "	" "	15,000
Perrigo Lake, " "	" "	5,000
Goose Lake, " "	" "	5,000
Golden Lake, " "	" "	22,500
Kohaheshemagabog Lake, District of Muskoka	" "	14,000
McKay's Lake, District of Muskoka	" "	12,000
Muskoka River, " "	" "	4,000
Skeleton Lake " "	" "	12,000
Bass Lake, Hastings County	Bass Fingerlings	30,000
Beaver Lake, Lennox County	" "	14,000
White Lake, " "	" "	6,000
Lime Lake, " "	" "	20,000
Gannous Narrows, Peterboro' County	" "	10,000
Stoney Lake, " "	" "	10,000
Clear Lake " "	" "	10,000
Round Lake " "	" "	5,000
Grand River at Paris, Brant County	" "	5,000
Victoria Lake, Stratford, Perth County	" "	10,000
Waters in the vicinity of Mitchell, Perth County	" "	5,000
Scugog Lake, West Durham County	" "	10,000
Round Lake, Peterboro' County	" "	1,000
Denbigh Lake, Addington County	" "	1,000
Rideau River, Grenville County	" "	10,000
Long Lake, Frontenac County	" "	4,000
Thirteen and Thirty Island Lakes, Frontenac County	" "	4,000
Chain Lakes, Renfrew County	" "	1,000
Cache Lake, Algonquin Park	" "	30,000
Rainy Lake, District of Parry Sound	" "	4,000
Fish Lake " " "	" "	2,000
Sand Lake " " "	" "	2,000
Grand River, Galt, Waterloo County	" "	8,000
Grand River, Berlin, " "	" "	8,000
Saugeen River, Bruce County	" "	15,000
Lake of Bays, District of Muskoka	" "	10,000
Moose Lake, District of Nipissing	" "	3,000
Boyse Lake, " "	" "	6,000
Rib Lake, " "	" "	4,000
Long Lake " "	" "	10,000
Kenogami Lake, District of Temiskaming	" "	10,000
Sesesekenika Lake " "	" "	5,000
Snell's Lake, Brampton, Peel County	" "	1,500
Waters in the vicinity of Woodstock, Oxford County	Parent Bass	225
Victoria Lake, Stratford, Perth County	" "	21
Grand River, Brantford, Brant County	" "	84
Whiteman's Creeks, Waterloo County	Trout (Brown)	800
Waters in the vicinity of Simcoe, Norfolk County	" "	1,500
Bell and Ewart Lakes, Grey County	" (Brook)	30,000
Streams in the vicinity of Simcoe, Norfolk County	" "	15,000
Beaver River, Meaford, Grey County	" "	15,000
Streams in the vicinity of Havelock, Peterboro' County	" "	25,000
Streams in the vicinity of Berlin, Waterloo County	" "	10,000
Streams in the vicinity of Bethany, East Durham County	" "	21,000
	Total Advance Bass Fry.	205,500
	" Bass Fingerlings	274,500
	" Parent Bass	330
	" Trout (Brown)	2,300
	" " (Brook)	116,000
	Grand Total	598,630

WATERS STOCKED FROM 1901 TO 1914, WITH THE NUMBER AND KINDS OF FISH PLANTED IN EACH.—Continued. 1912—.

Waters Stocked and Location.	Species.	Number.
Muskoka Lake in Muskoka District	Bass Fingerlings	12,000
Rosseau Lake " " "	" "	11,000
Gull Lake " " "	" "	4,000
Joseph Lake " " "	" "	10,000
Vernon Lake " " "	" "	2,500
Fairy Lake " " "	" "	2,500
Mary Lake " " "	" "	2,500
Peninsula Lake " " "	" "	2,500
Cache Lake " Algonquin Park	" "	10,000
Sturgeon Lake " Kawartha District	" "	4,000
Balsam Lake " " "	" "	3,000
Cameron Lake " " "	" "	2,000
Loughboro and Collins Lakes in Frontenac County	" "	2,000
Long Lake on Timiskaming and Northern Ontario Railway	" "	2,000
Kenogami Lake " " "	" "	5,000
Sesekinika Lake " " "	" "	5,000
Grand River	Parent Bass	300
Belle and Ewart Lakes in Grey County	Trout (Speckled)	20,000
Streams in Norfolk County	" "	50,000
	Total Bass Fingerlings	80,000
	" Parent Bass	300
	" Trout (Speckled)	70,000
	Grand Total	150,300

1913.

Waters Stocked and Location.	Species.	Number.
Fox Lake in Kenora District	Bass Fingerlings	15,000
Muskoka Lake in District of Muskoka	" "	10,000
Joseph Lake " " " "	" "	8,000
Rosseau Lake " " " "	" "	7,000
Gull Lake " " " "	" "	5,000
Windy Lake " Sudbury District	" "	5,000
Rumsey Lake " " "	" "	5,000
Horse Shoe or Pah-She-Gong-Ga Lake in Parry Sound District	" "	5,000
Trout Lake on the Timiskaming & Northern Ontario Ry.	" "	5,000
Moose " " " " " " "	" "	5,000
Rib " " " " " " "	" "	5,000
Scugog Lake in the Kawartha District	" "	5,000
Charleston Lake in Leeds County	" "	5,000
Grand River in the vicinity of Breslau	" "	5,000
Grand River in the vicinity of Brantford	" "	400
Streams in the vicinity of King, York County	Parent Bass	200
Rib Lake on the Timiskaming & Northern Ontario Railway	" "	25
Gull Lake in Muskoka District	" "	20
Muskoka Lake in " "	" "	20
Sharbot " " Frontenac County	" Pickerel	100
Clear " " "	" "	50
Speed River in vicinity of Hespeler	Trout (Brown)	1,000
Streams in the vicinity of Simcoe, Norfolk County	" "	1,000
Streams " " " St. Paul's, Perth County	" "	1,000
Bell and Ewart Lakes in Grey County	" (Speckled)	30,000
Utterson Lakes in Muskoka District	" "	20,000
Squires Creek, in the vicinity of Spring Brook, in Hastings County	" "	20,000
Streams in the vicinity of Simcoe, Norfolk County	" "	10,000
	Total Bass Fingerlings	90,400
	" Parent Bass	265
	" " Pickerel	150
	" Trout (Brown)	3,000
	" " (Speckled)	80,000
	Grand Total	173,815

Statement showing the number of fry distributed in the waters of the Province by the Federal Government from Dominion hatcheries.

Years.	Neweastle Hatchery.	Sandwich Hatchery.	Ottawa Hatchery.	Wiarton.	Sarnia.	Total.
1868-73	1,070,000	.....	.....	.....	.....	1,070,000
1874	350,000	.....	.....	.....	.....	350,000
1875	650,000	.....	.....	.....	.....	650,000
1876	700,000	8,000,000	.....	.....	.....	8,700,000
1877	1,300,000	8,000,000	.....	.....	.....	9,300,000
1878	2,605,000	20,000,000	.....	.....	.....	22,605,000
1879	2,602,700	12,000,000	.....	.....	.....	14,602,700
1880	1,923,000	13,500,000	.....	.....	.....	15,423,000
1881	3,300,000	16,000,000	.....	.....	.....	19,300,000
1882	4,841,000	44,000,000	.....	.....	.....	48,841,000
1883	6,053,000	72,000,000	.....	.....	.....	78,053,000
1884	8,800,000	37,000,000	.....	.....	.....	45,800,000
1885	5,700,000	68,000,000	.....	.....	.....	73,700,000
1886	6,451,000	57,000,000	.....	.....	.....	63,451,000
1887	5,130,000	56,500,000	.....	.....	.....	61,630,000
1888	8,076,000	56,000,000	.....	.....	.....	64,076,000
1889	5,846,500	21,000,000	.....	.....	.....	26,846,500
1890	7,736,000	52,000,000	5,732,000	.....	.....	65,468,000
1891	7,807,500	75,000,000	7,043,000	.....	.....	89,850,500
1892	4,823,500	44,500,000	4,909,000	.....	.....	54,232,500
1893	9,835,000	68,000,000	6,208,000	.....	.....	84,043,000
1894	6,000,000	47,000,000	4,480,000	.....	.....	57,480,000
1895	6,000,000	73,000,000	3,210,000	.....	.....	82,210,000
1896	5,200,000	61,000,000	3,950,000	.....	.....	70,150,000
1897	4,200,000	72,000,000	4,100,000	.....	.....	80,300,000
1898	4,325,000	71,000,000	3,020,000	.....	.....	78,345,000
1899	4,050,000	73,000,000	3,700,000	.....	.....	80,750,000
1900	5,175,000	90,000,000	3,450,000	.....	.....	98,625,000
1901	5,900,000	67,000,000	3,410,000	.....	.....	76,310,000
1902	650,000	100,000,000	1,245,000	.....	.....	101,895,000
1903	2,500,000	90,000,000	1,201,000	.....	.....	93,701,000
1904	1,475,000	75,000,000	877,000	.....	.....	77,352,000
1905	1,480,000	106,000,000	1,103,000	.....	.....	108,583,000
1906	1,550,000	88,000,000	1,123,000	.....	.....	90,673,000
1907	1,807,000	103,000,000	1,152,000	.....	.....	105,959,000
1908	2,600,000	79,000,000	2,010,000	4,955,000	51,000,000	139,565,000
1909	1,881,000	66,500,000	1,575,000	8,100,000	159,500,000	237,556,000
1910	1,520,400	76,000,000	1,478,000	12,088,000	74,000,000	165,086,400
1911	1,543,816	77,000,000	.....	12,249,500	113,500,000	204,293,316
1912	1,599,716	29,000,000	.....	12,399,900	77,000,000	119,999,616
Totals...	155,057,132	2,172,000,000	64,976,000	49,792,400	475,000,000	2,916,825,532

ONTARIO

Return of the number of fishermen, tonnage and value of tugs, vessels and boats, the industry during the year 1913, in the Public

Number.	District.	Fishing material.								
		Tugs or Gasoline Launches.				Row or Sail Boats.			Gill-Nets.	
		No.	Tonnage.	Value.	Men.	No.	Value.	Men.	Yards.	Value.
	Kenora and Rainy River.			$			$			$
1	Lake of the Woods	22	.....	14,068	46	12	2,425	22	34,000	5,000
2	Crow, Oneman, Sandy and Shoal Lakes	4	.....	1,450	9	4	280	8	12,000	1,500
3	Lac Suele	2	.....	700	.....	2	150	12	8,000	1,500
4	Abram, Lost, Minnitakie, Pelican and Vermilion Lakes	2	.....	575	4	3	270	10	12,000	875
5	Eagle, Indian, Isabester, Manitou, Orang Outang and Wabigoon Lakes	2	.....	950	5	3	415	9	12,000	1,800
6	Rainy Lake	.....	.....	.....	.....	16	4,210	29	24,900	1,625
7	Height of Land, Loon and Pipestone Lakes	.....	.....	.....	.....	.....	.....	.....	3,000	265
8	Clearwater, Elbow, Eva, Namakan and Steep Rock Lakes	.....	.....	.....	.....	3	950	7	6,000	.....
	Totals	32	.....	17,743	64	43	8,700	97	111,900	12,565

Return of the kinds, quantities and values of fish caught during the

Number	District.	Herring, salted.	Herring, fresh.	Whitefish, salted.	Whitefish, fresh.	Trout, salted.	Trout, fresh.	Pike.	Pickerel or Dore.
	Kenora and Rainy River	brls.	lbs.	brls.	lbs.	brls.	lbs.	lbs.	lbs.
1	Lake of the Woods	.....	.....	.....	707,396	.....	26,075	483,206	556,209
2	Crow, Oneman, Sandy and Shoal Lakes	.....	.....	.....	210,874	.....	16,233	47,732	77,800
3	Lac Suele	.....	.....	.....	104,074	.....	.....	10,080	69,756
4	Abram, Lost, Minnitakie, Pelican and Vermilion Lakes	.....	.....	.....	34,118	.....	15,433	6,320	9,215
5	Eagle, Indian, Isabester, Manitou, Orang Outang and Wabigoon Lakes	.....	.....	.....	47,150	.....	14,267	14,810	48,670
6	Rainy Lake	.....	.....	.....	69,494	.....	.....	125,706	106,705
7	Height of Land, Loon and Pipestone Lakes	.....	.....	.....	7,800	.....	3,400	1,500	5,500
8	Clearwater, Elbow, Eva, Namakan and Steep Rock Lakes	.....	.....	.....	18,300	.....	14,650	3,500	6,100
	Totals	.....	.....	.....	1,199,206	.....	90,058	692,854	879,955
	Values	.....	.....	.....	$ c. 119,920 60	$ c.	$ c. 9,005 80	$ c. 55,428 32	$ c. 87,995 50

FISHERIES.

quantity and value of all fishing materials and other fixtures employed in the fishing Waters of Kenora and Rainy River District.

Fishing material.													Other fixtures used in fishing.			
Seines.			Pound nets.		Hoop nets.		Dip nets.		Night lines.		Spears.		Freezers and Ice Houses.		Piers and Wharves.	
No.	Yards.	Value.	No.	Value.	No.	Value.	No.	Value.	No. Hooks.	Value.	No.	Value.	No.	Value.	No.	Value.
		$		$		$		$		$		$		$		$
....	.....	.....	28	9,000	12	1,075	....	.....	.....	.....	....	.....	4	4,700	7	1,730
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	2	900	2	90
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	2	1,000	2	700
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	2	600	....	.....
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	4	1,325	3	225
....	.....	.....	2	325	....	.....	....	.....	400	.....	....	.....	10	1,600	....	.....
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	1	.....	....	.....	....	.....	.....	.....	....	.....	1	.....	....	.....
....	.....	.....	31	9,325	12	1,075	....	.....	400	.....	....	.....	25	10,125	14	2,745

year 1913, in the Public Waters of Kenora and Rainy River Districts.

Sturgeon.	Eels.	Perch.	Tullibee.	Catfish.	Mixed and coarse fish.	Caviare.	Sturgeon Bladders.	Carp.	Value.
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	$ c.
84,800	.....	.....	130,510	17,006	175,242	2,175	128	.....	200,549 46
.....	.....	.....	4,800	.....	3,000	.....	.....	.....	34,747 26
.....	.....	.....	.....	.....	8,654	.....	.....	.....	18,622 10
.....	.....	.....	1,132	.....	1,980	.....	.....	.....	6,549 12
.....	.....	.....	.....	.....	9,050	.....	.....	.....	12,646 00
2,730	.....	.....	34,637	.....	47,776	125	.....	.....	32,677 90
.....	.....	.....	.....	.....	500	.....	.....	.....	1,815 00
2,200	.....	.....	6,300	.....	800	50	.....	.....	4,982 00
89,730	.....	.....	177,379	17,006	247,002	2,350	128	.....	312,589 84
$ c.	.....	.....	$ c.	$ c.	$ c.	$ c.	$ c.	.....	$ c.
13,459 50	.....	.....	10,642 74	1,360 48	12,350 10	2,350 00	76 80	.....	312,589 84

ONTARIO

Return of the number of fishermen, tonnage and value of tugs, vessels and boats, fishing industry during the year 1913,

Number.	District.	Fishing material.								
		Tugs or Gasoline Launches				Row or Sail Boats.			Gill-Nets.	
		No.	Tonnage.	Value.	Men.	No.	Value.	Men.	Yards.	Value.
	Lake Superior.			$			$			$
1	Pigeon River to Thunder Cape (including Thunder Bay) ..	2	72	9,000	10	5	345	9	102,000	5,700
2	Thunder Cape to Simpson's Island (including Black Bay, etc.)	4	115	15,200	16	2	135	4	49,000	3,400
3	Rossport	8	210	24,000	22	5	150	8	144,000	8,250
4	Jackfish and Port Coldwell ..	2	30	5,900	9	.....	.....	.....	32,000	3,200
5	Michipicoten	3	32	10,800	15	4	600	7	109,300	3,535
6	Gargantua	1	20	7,500	10	4	570	8	74,100	1,100
7	Lizard Islands	1	8	2,500	6	7	1,550	14	38,500	3,050
8	Mamaise	1	5	500	2	3	475	7	25,000	2,100
9	Batchewana	.....	.....	.....	.....	12	2,775	22	51,000	3,700
10	Richardson's Harbor	2	24	8,300	12	.....	.....	.....	72,000	1,000
11	Goulis Bay	1	5	500	2	10	1,300	20	34,400	2,250
12	Persian Islands	1	5	500	2	.....	.....	.....	12,000	4,000
13	Gros Cap	1	5	500	2	7	950	12	29,000	2,050
14	Lac des Milles Lac, Sturgeon and Windigoostigwan	.....	.....	.....	.....	5	185	10	10,000	964
	Totals	27	531	85,200	108	64	9,035	121	782,300	44,299

Return of the kinds, quantities and values of fish caught

Number.	District.	Herring, salted.	Herring, fresh.	Whitefish, salted.	Whitefish, fresh.	Trout, salted.	Trout, fresh.	Pike.	Pickerel, or Dore.
	Lake Superior.	brls.	lbs.	brls.	lbs.	brls.	lbs.	lbs.	lbs.
1	Pigeon River to Thunder Cape (including Thunder Bay) ..	.....	261,000	.....	23,136	500	188,044	.....	.....
2	Thunder Cape to Simpson's Island (including Black Bay, etc.)	.....	1,000	.....	45,191	600	121,571	4,230	16,800
3	Rossport	.....	21,000	100	40,985	171	206,323	230	8,750
4	Jackfish and Port Coldwell ..	.....	.....	.....	24,000	220	88,000	.....	.....
5	Michipicoten	.....	.....	.....	29,835	163	278,695	.....	.....
6	Gargantua	.....	2,000	.....	15,005	135	168,095	.....	.....
7	Lizard Islands	6	.....	.....	58,228	.....	58,795	.....	.....
8	Mamaise	.....	.....	2	10,056	23	93,795	30	44
9	Batchewana	.....	2,000	.....	25,650	.....	37,920	50	.....
10	Richardson's Harbor	.....	.....	.....	7,974	450	88,339	.....	.....
11	Goulis Bay	.....	.....	.....	34,700	.....	32,100	.....	200
12	Persian Islands	6	.....	.....	4,400	.....	7,500	1,000	1,000
13	Gros Cap	.....	12,000	.....	17,100	.....	20,500	.....	.....
14	Lac des Milles Lac, Sturgeon and Windigoostigwan	.....	.....	.....	37,208	.....	12,000	32,661	77,274
	Totals	12	299,000	102	373,468	2,262	1,401,677	38,201	104,068
	Values	$ c. 120 00	$ c. 14,950 00	1,020 00	$ c. 37,346 80	$ c. 22,620 00	$ c. 140,167 70	$ c. 3,056 08	$ c. 10,406·80

FISHERIES.

the quantity and value of all fishing materials and other fixtures employed in the
in the Public Waters of Lake Superior.

Fishing material.													Other fixtures used in fishing.			
Seines.			Pound Nets.		Hoop Nets.		Dip Nets.		Night Lines.		Spears.		Freezers and Ice Houses.		Piers and Wharves.	
No.	Yards.	Value.	No.	Value.	No.	Value.	No.	Value.	No. Hooks.	Value.	No.	Value.	No.	Value.	No.	Value.
				$										$		$
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	4	500	....	.....	....	.....	.....	.....	....	.....	2	1,000	1	200
....	.....	.....	7	1,050	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	1	150	....	.....	....	.....	.....	.....	....	.....	3	2,300	....	.....
....	.....	.....	...	.....	....	.....	....	.....	.....	.....	....	.....	1	1,000	....	.....
....	.....	.....	...	.....	....	.....	....	.....	.....	.....	....	.....	1	.....	1	3,000
....	.....	.....	6	3,000	...	.....	....	.....	.....	.....	....	.....	1	1,000	1	3,000
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	1	500	1	1,000
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	1	3,000	....	.....
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	1	.....	....	.....	....	.....	.....	.....	....	.....	1	200	1	100
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	1	300	1	500
....	.....	.....	1	.....	....	.....	....	.....	.....	.....	....	.....	1	100	1	100
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	1	400	....	.....
....	.....	.....	20	4,700	....	.....	....	.....	.....	.....	....	.....	14	10,200	7	7,900

during the year 1913, in the Public Waters of Lake Superior.

Sturgeon.	Eels.	Perch.	Tullibee.	Catfish.	Mixed and coarse fish.	Caviare.	Sturgeon bladders.	Carp.	Value.
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	$ c.
.....	.....	.....	.....	.....	.....	.....	.....	.....	39,168 00
2,380	.....	.....	.....	.....	3,395	.....	.....	.....	25,271 35
380	.....	.....	.....	.....	3,395	.....	.....	.....	29,610 95
.....	.....	.....	.....	.....	80,000	.....	.....	.....	17,400 00
.....	.....	.....	.....	.....	.....	.....	.....	.....	32,483 00
.....	.....	.....	.....	.....	.....	.....	.....	.....	19,760 00
.....	.....	.....	.....	.....	19,000	.....	.....	.....	12,712 30
.....	.....	.....	.....	.....	.....	.....	.....	.....	10,641 90
.....	.....	.....	.....	.....	4,500	.....	.....	.....	6,686 00
.....	.....	.....	.....	.....	.....	.....	.....	.....	14,131 30
.....	.....	.....	.....	.....	.....	.....	.....	.....	6,700 00
.....	.....	.....	.....	.....	.....	.....	.....	.....	1,430 00
.....	.....	.....	.....	.....	.....	.....	.....	.....	4,360 00
.....	.....	.....	873	.....	241	.....	.....	.....	15,325 51
2,760	.....	.....	873	.....	110,531	.....	.....	.....	235,680 31
$ c. 414 00	.....	.....	$ c. 52 38	.....	5,526 55	.....	.....	.....	$ c. 235,680 31

ONTARIO

Return of the number of fishermen, tonnage and value of tugs, vessels and boats, fishing industry during the year 1913, in the

Number.	District.	Fishing material.								
		Tugs or Gasoline Launches.				Row or Sail Boats.			Gill-Nets.	
		No.	Tonnage.	Value.	Men.	No.	Value.	Men.	Yards.	Value.
	Lake Huron, North Channel.									
1	Bruce Mines and Thessalon (including St. Joseph Island)	1	.....	$ 400	2	7	$ 550	14	21,000	$ 1,445
2	Thessalon to Blind River	2	.....	1,200	6	5	925	9	10,000	575
3	Algoma Mills to Spanish (including John's Island)	1	.....	500	2	9	745	18	36,750	1,860
4	Gore Bay and Kagawong	1	2	1,900	8	4	175	5	61,300	466
5	Little Current	2	.....	1,125	6	6	605	11	8,100	576
6	Manitowaning and Fraser Bays	5	75	8,800	18	7	533	10	8,400	498
7	Killarney	6	20	4,350	15	12	23,100	25	7,100	3,523
8	Squaw, Rabbit and Fitzwilliam Islands	8	163	22,300	36	5	835	8	296,600	11,896
9	South Bay and Providence Bay	4	85	12,500	21	3	262	5	219,100	15,457
10	Duck Islands	3	44	10,000	19	4	2,000	8	10,800	8,300
11	Mississagi Straits, Meldrum Bay and Cockburn Island	5	102	26,800	26	4	197	5	181,300	6,867
12	Lake Kagawong	.....	.....	.....	.....	4	181	4	400	24
	Totals	38	491	89,875	159	70	30,108	122	860,850	51,487

Return of the kinds, quantities and values of fish caught during

Number.	District.	Herring, salted.	Herring, fresh.	Whitefish, salted.	Whitefish, fresh.	Trout, salted.	Trout, fresh.	Pike.	Pickerel, or Dore.
	Lake Huron, North Channel.								
1	Bruce Mines and Thessalon (including St. Joseph Island)	brls.	lbs.	brls. 250	lbs. 22,098	brls.	lbs. 26,216	lbs. 23,042	lbs. 9,787
2	Thessalon to Blind River	.....	.....	1	27,760	.....	24,097	5,141	46,155
3	Algoma Mills to Spanish (including John's Island)	155	19,223	.....	2,809	.....	13,853	24,417	185,644
4	Gore Bay and Kagawong	.....	.....	.....	19,694	.....	60,874	2,366	26,427
5	Little Current	.....	.....	.....	13,782	.....	15,802	2,508	13,489
6	Manitowaning and Fraser Bays	.....	.....	.....	48,329	4	44,964	10,666	106,936
7	Killarney	.....	.....	.....	145,828	.....	70,427	16,659	13,141
8	Squaw, Rabbit and Fitzwilliam Islands	.....	.....	.....	220,138	70	323,188	2,044	353
9	South Bay and Providence Bay	.....	.....	.....	15,975	13	366,528	.....	.....
10	Duck Islands	.....	.....	.....	6,000	.....	302,698	.....	.....
11	Mississagi Straits, Meldrum Bay and Cockburn Island	.....	400	.....	75,932	.....	471,130	72	35,017
12	Lake Kagawong	.....	.....	.....	795	.....	120	347	.....
	Totals	155	19,623	251	599,140	87	1,719,897	87,262	436,949
	Values	$ c. 1,550 00	$ c. 981 15	$ c. 2,510 00	$ c. 59,914 00	$ c. 870 00	$ c. 171,989 70	$ c. 6,980 96	$ c. 43,694 90

FISHERIES

the quantity and value of all fishing materials and other fixtures employed in the Public Waters of Lake Huron, North Channel.

Fishing material.													Other fixtures used in fishing.			
Seines.			Pound nets.		Hoop nets.		Dip nets.		Night lines.		Spears.		Freezers and Ice Houses.		Piers and Wharves.	
No.	Yards.	Value.	No.	Value.	No.	Value.	No.	Value.	No. Hooks.	Value.	No.	Value.	No.	Value.	No.	Value.
		$		$		$		$		$		$		$		$
....	.....	.....	3	800	....	.....	....	.....	.....	.....	....	.....	5	600	1	100
....	.....	.....	18	5,000	....	.....	....	.....	.....	.....	....	.....	6	2,500	4	1,100
....	.....	.....	1	150	....	.....	....	.....	.....	.....	....	.....	4	550	....	.....
....	.....	.....	5	1,500	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	4	550	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	25	7,000	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	8	2,800	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	13	3,500	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	9	2,800	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	11	3,900	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	97	28,000	....	.....	....	.....	.....	.....	....	.....	15	3,650	5	1,200

the year 1913, in the Public Waters of Lake Huron, North Channel.

Sturgeon.	Eels.	Perch.	Tullibee.	Catfish.	Mixed and Coarse fish.	Caviare.	Sturgeon Bladders.	Carp.	Value.
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	$ c.
57	.....	2,430	.....	.....	32,432	.....	.....	.....	11,905 11
8,596	.....	200	.....	74	103,279	210	.....	.....	16,901 75
9,876	.....	2,873	.....	1,857	177,126	28	.....	.....	35,353 02
1,624	.....	.....	.....	.....	1,987	.....	.....	.....	11,231 73
2,138	.....	980	.....	200	15,133	.....	.....	.....	5,650 29
6,329	.....	.....	.....	.....	39,574	.....	.....	.....	23,844 23
400	.....	1,000	.....	375	8,632	.....	.....	.....	24,843 92
170	.....	.....	.....	.....	.....	.....	.....	.....	55,256 92
.....	.....	.....	1,105	.....	.....	.....	.....	.....	38,446 60
500	.....	.....	20,000	.....	.....	.....	.....	.....	32,144 80
291	.....	321	30	.....	65,328	11½	.....	.....	61,576 06
.....	.....	.....	.....	.....	.....	.....	.....	.....	119 26
29,981	.....	7,804	21,135	2,506	443,491	252½	.....	.....	317,273 69
$ c.		$ c.	$ c.	$ c.	$ c.	$ c			$ c.
4,497 15	.....	390 20	1,268 10	200 48	22,174 55	252 5	.....	.....	317,273 69

ONTARIO

Return of the number of fishermen, tonnage and value of tugs, vessels and boats, the industry during the year 1913,

Number.	District.	Fishing material.								
		Tugs or Gasoline Launches.				Sail or Row Boats.			Gill-Nets.	
		No.	Tonnage.	Value.	Men.	No.	Value.	Men.	Yards.	Value.
	Georgian Bay.			$			$			$
1	Byng Inlet	4	.....	4,750	11	2	240	4	71,500	1,693
2	Parry Sound	10	.....	11,700	35	5	450	.....	249,600	13,500
3	Waubaushene	.....	.....	.....	.....	13	1,460	19	41,600	30,300
4	Penetanguishene	5	16	1,350	11	1	.....	2	34,450	1,182
5	Collingwood	10	52	6,250	24	9	680	15	112,500	6,895
6	Meaford (including Owen Sound Bay)	15	.....	21,710	43	14	750	23	380,950	16,088
7	Colpoy's Bay to Tobermory	13	41	10,150	31	49	2,644	60	184,650	13,750
	Totals	57	109	50,910	155	93	6,224	123	1,075,250	83,408

Return of the kinds, quantities and values of fish caught

Number.	District.	Herring, salted.	Herring, fresh.	Whitefish, salted.	Whitefish, fresh.	Trout, salted.	Trout, fresh.	Pike.	Pickerel or Dore.
	Georgian Bay	brls.	lbs.	brls.	lbs.	brls.	lbs.	lbs.	lbs.
1	Byng Inlet	65	.....	.....	83,850	.....	22,800	14,235	33,217
2	Parry Sound	.....	.....	.....	200,949	29	226,444	3,067	8,004
3	Waubaushene	4	.....	79	6,300	36	5,800	19,605	4,400
4	Penetanguishene	71	5,500	26½	44,070	86	60,070	76	.....
5	Collingwood	.....	22,000	300	22,650	.....	67,650	.....	.....
6	Meaford (including Owen Sound Bay)	.....	19,400	.....	10,516	1,167	324,681	.....	.....
7	Colpoy's Bay to Tobermory	37½	8,250	2½	6,408	71½	223,435	.....	.....
	Totals	177½	55,150	408	374,743	1,389½	930,880	36,983	45,621
	Values	$ c. 1,775 00	$ c. 2,757 50	$ c. 4,080 00	$ c. 37,474 30	$ c. 13,895 00	$ c. 93,088 00	$ c. 2,958 64	$ c. 4,562 10

FISHERIES

quantity and value of all fishing materials and other fixtures employed in the fishing in the Public Waters of the Georgian Bay.

Fishing material.													Other fixtures used in fishing.			
Seines.			Pound nets.		Hoop nets.		Dip nets		Night Lines.		Spears.		Freezers and Ice Houses		Piers and Wharves.	
No.	Yards.	Value.	No.	Value.	No.	Value.	No.	Value.	No. Hooks.	Value.	No.	Value.	No.	Value.	No.	Value.
		$				$		$		$		$		$		$
...	...	...	8	1,200	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	5	1,775	...	...
...	...	...	...	...	13	800	...	...	...	...	...	...	1	250	1	100
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	60
...	...	...	...	...	...	...	...	...	...	...	...	...	8	4,325	2	2,450
...	...	...	8	1,200	13	800	...	...	...	...	...	...	14	6,350	4	2,610

during the year 1913, in the Public Waters of the Georgian Bay.

Sturgeon.	Eels.	Perch.	Tullibee.	Catfish.	Mixed and coarse fish.	Caviare.	Sturgeon Bladders.	Carp.	Value.
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	$ c.
1,689	...	...	...	75	15,065	75	...	...	16,863 10
...	...	...	...	...	...	...	...	...	44,075 06
...	...	2,560	...	5,915	30,190	...	...	...	6,519 10
...	...	...	3	...	72	...	...	...	12,533 86
5,200	...	1,300	...	...	900	760	...	...	14,780 00
...	...	...	...	...	...	...	...	...	46,159 70
...	...	...	63,700	...	...	...	...	...	28,333 80
6,889	...	3,860	63,703	5,990	46,227	835	...	...	169,264 62
$ c. 1,033 35	...	$ c. 193 00	$ c. 3,822 18	$ c. 479 20	$ c. 2,311 35	$ c. 835 00	...	$ c. ...	$ c. 169,264 62

ONTARIO

Return of the number of fishermen, tonnage and value of tugs, vessels and boats, fishing industry during the year 1913,

Number.	District.	Fishing material.								
		Tugs or Gasoline Launches.				Row or Sail Boats.			Gill-Nets.	
		No.	Tonnage.	Value.	Men.	No.	Value.	Men.	Yards.	Value.
	Lake Huron (Proper).			$			$			$
1	Tobermory to Southampton ..	12	172	24,050	54	21	2,020	30	406,800	23,158
2	Southampton to Pine Pt.....	3	.....	4,000	10	8	195	9	134,700	6,395
3	County of Huron	10	21	3,800	25	.....	.....	.....	40,400	2,840
4	County of Lambton (including River St. Clair)	.....	.....	.....	.....	37	6,325	58	2,000	.....
	Totals	25	193	31,850	89	66	8,540	97	583,900	32,393

Returns of the kinds, quantities and values of fish caught

Number.	District.	Herring, salted.	Herring, fresh.	Whitefish, salted.	Whitefish, fresh.	Trout, salted.	Trout, fresh.	Pike.	Pickerel, or Dore.
	Lake Huron (Proper).	brls.	lbs.	brls.	bs.	brls.	lbs.	lbs.	lbs.
1	Tobermory to Southampton ..	287	75,462	14	21,395	351	475,103	153	44
2	Southampton to Pine Pt.....	.....	.....	.....	600	.....	91,495	.....	.....
3	County of Huron	.....	18,535	.....	5,575	.....	98,801	.....	12,861
4	County of Lambton (including River St. Clair)	1	48,407	.....	8,647	....	7,859	1,440	108,710
	Totals	288	142,404	14	36,217	351	673,258	1,593	121,615
	Values	$ c. 2,880 00	$ c. 7,120 20	$ c. 140 00	$ c. 3,621 70	$ c. 3,510 00	$ c. 67,325 80	$ c 127 44	$ c. 12,161 50

FISHERIES.

the quantity and value of all fishing materials and other fixtures employed in the
in the Public Waters of Lake Huron (Proper).

Fishing material.													Other fixtures used in fishing.			
Seines.			Pound nets.		Hoop nets.		Dip Nets.		Night Lines.		Spears.		Freezers and Ice Houses.		Piers and Wharves.	
No.	Yards.	Value.	No.	Value.	No.	Value.	No.	Value.	No. Hooks.	Value.	No.	Value.	No.	Value.	No.	Value.
		$		$		$		$ c.		$		$		$		
....	....	.....	2	300	....	.....	....	.....	.....	.....	....	.....	3	2,800	....	.....
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	8	1,800	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
3	135	150	55	13,800	1	25	....	.....	.....	.....	....	.....	1	400	....	.....
3	135	150	66	15,900	1	25	....	.....	.....	.....	....	.....	4	3,200	....	.....

during the year 1913, in the Public Waters of Lake Huron (Proper).

Sturgeon.	Eels.	Perch.	Tullibee.	Catfish.	Mixed and coarse fish.	Caviare.	Sturgeon Bladders.	Carp.	Value.
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	$ c.
3,000	.....	20,320	243,800	15	.....	50	.....	.....	76,104 74
.....	.....	.....	.....	.....	.....	.....	.....	.....	9,209 50
1,700	.....	25,085	.....	.....	8,975	70	.....	.....	14,678 45
9,482	3	3,953	.....	169	50,883	847	7	1,600	20,176 15
14,182	3	49,358	243,800	184	59,858	967	7	1,600	120,168 84
$ c. 2,127 30	$ c. 18	$ c. 2,467 90	$ c. 14,628 00	$ c. 14 72	$ c. 2,992 90	$ c. 967 00	$ c. 4 20	$ c. 80 00	$ c. 120,168 84

ONTARIO

Return of the number of fishermen, tonnage and value of tugs, vessels and boats, fishing industry during the year 1913,

Number.	District.	Fishing material.								
		Tugs or Gasoline Launches.				Row or Sail Boats.			Gill-Nets.	
		No.	Tonnage.	Value.	Men.	No.	Value.	Men.	Yards.	Value.
	Lake St. Clair.			$			$			$
1	Kent County (including River Thames)	27	.....	5,900	39	23	945	34	.....	.....
2	Essex County	.....	.....	.....	.....	31	5,670	69	.....	.....
3	Detroit River	2	6	300	21	28	583	72	.....	.....
	Totals	29	6	6,200	60	82	7,198	175	.....	.....

Return of the kinds, quantities and values of fish caught during

Number.	District.	Herring, salted.	Herring, fresh.	Whitefish, salted.	Whitefish, fresh.	Trout, salted.	Trout, fresh.	Pike.	Pickerel or Dore.
	Lake St. Clair.	brls.	lbs.	brls.	lbs.	brls.	lbs.	lbs.	lbs.
1	Kent County (including River Thames)	.....	.....	.....	.....	.....	.....	18,185	17,787
2	Essex County	.....	.....	.....	12,350	.....	.....	8,900	40,745
3	Detroit River	.....	100	.....	58,000	.....	.....	11,750	8,490
	Totals	.....	100	.....	70,350	.....	.....	38,835	67,022
	Values	.....	$ c. 5 00	.....	$ c. 7,035 00	.....	.....	$ c. 3,106 80	$ c. 6,702 20

FISHERIES.

the quantity and value of all fishing materials and other fixtures employed in the in the Public Waters of Lake St. Clair.

Fishing material.													Other fixtures used in fishing.			
Seines.			Pound nets.		Hoop nets.		Dip nets.		Night Lines.		Roll Nets.		Freezers and Ice Houses.		Piers and Wharves.	
No.	Yards.	Value.	No.	Value.	No.	Value.	No.	Value.	No. Hooks.	Value.	No.	Value.	No.	Value.	No.	Value.
		$		$		$		$		$		$		$		$
4	2,532	1,110	....	.....	104	5,775	7	160	2,400	46	24	810	9	2,500	14	2,650
12	1,200	300	12	2,900	59	3,760	....	.....	2,150	106	....	.....	....	.....	....	.....
28	1,315	915	....	.....	1	15	....	.....	300	10	....	.....	....	.....	2	45
44	5,047	2,325	12	2,900	164	9,550	7	160	4,850	162	24	810	9	2,500	16	2,695

the year 1913, in the Public Waters of Lake St. Clair.

Sturgeon.	Eels.	Perch.	Tullibee.	Catfish.	Mixed and coarse fish.	Caviare.	Sturgeon bladders.	Carp.	Value.
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	$ c.
6,743	.....	47,227	20,050	26,988	344,549	.....	.....	12,765	27,834 04
52,335	.....	23,215	.....	42,840	126,910	326	.....	56,700	27,966 20
1,050	.....	5,050	.....	600	36,650	.....	.....	63,200	13,044 50
60,128	.....	75,492	20,050	70,428	508,109	326	.....	132,665	68,844 74
$ c.		$ c.	$ c.	$ c.	$ c.	$ c.		$ c.	$ c.
9,019 20	.....	3,774 60	1,203 00	5,634 24	25,405 45	326 00	.....	6,633 25	68,844 74

ONTARIO

Return of the number of fishermen, tonnage and value of tugs, vessels and boats, fishing industry during the year 1913,

Number.	District.	Fishing Material.								
		Tugs or Gasoline Launches.				Row and Sail Boats.			Gill-Nets.	
		No.	Tonnage.	Value.	Men.	No.	Value.	Men.	Yards.	Value.
	Lake Erie.			$			$			$
1	Pelee Island	4	65	11,800	26	4	325	11	57,000	36,500
2	Essex County	58	116	46,880	129	6	490	9	10,600	7,350
3	Kent West	39	50	27,950	66	.....	.....	.....	20,000	2,000
4	Kent East	29	69	10,950	79	.....	.....	.....	.....	.....
5	Elgin West	32	176	20,575	92	.....	.....	.....	85,580	8,160
6	Elgin East	18	600	110,500	115	5	4,600	17	202,700	31,710
7	Norfolk County	7	56	22,100	44	101	4,351	210	85,100	7,455
8	Haldimand County (to and including the Grand River).	13	90	32,150	58	30	720	35	74,300	11,501
9	Port Maitland to Port Colborne	3	19	3,850	6	8	210	4	15,815	4,450
10	Port Colborne to Niagara Falls	.....	.....	.....	.....	21	20	23	14,300	60
	Totals	203	1,241	286,755	615	175	10,716	309	565,395	109,186

Return of the kinds, quantities and values of fish caught

Number.	District.	Herring, salted.	Herring, fresh.	Whitefish, salted.	Whitefish, fresh.	Trout, salted.	Trout, fresh.	Pike.	Pickerel, or Dore.
	Lake Erie.	brls.	lbs.	brls.	lbs.	brls.	lbs.	lbs.	lbs.
1	Pelee Island	.....	319,376	.....	75,692	.....	.....	10,100	3,410
2	Essex County	.....	460,255	.....	733,125	.....	.....	227,102	287,914
3	Kent West	.....	1,156,161	.....	75,380	.....	.....	737,029	46,977
4	Kent East	.....	1,495,928	.....	87,318	.....	10	599,693	10,923
5	Elgin West	.....	1,401,971	.....	147,893	.....	.....	513,626	103,898
6	Elgin East	.....	4,446,150	.....	458,229	.....	.....	14,253	103,969
7	Norfolk County	.....	1,517,707	204	137,255	.....	219	48,043	125,283
8	Haldimand County (to and including the Grand River).	.....	677,956	.....	210,131	.....	1,540	118,627	242,866
9	Port Maitland to Port Colborne	.....	130,352	.....	13,969	.....	.....	19,129	4,075
10	Port Colborne to Niagara Falls	.....	2,572	.....	.....	.....	.....	.....	34,355
	Totals	.....	11,608,428	204	1,938,992	.....	1,769	2,287,602	963,670
	Values	.....	$ c. 580,421 40	$ c. 2,040 00	$ c. 193,899 20	.....	$ c. 176 90	$ c. 183,008 16	$ c. 96,267 00

FISHERIES.

the quantity and value of all fishing materials and other fixtures employed in the
in the Public Waters of Lake Erie.

Fishing material.													Other fixtures used in fishing.			
Seines.			Pound Nets.		Hoop Nets.		Dip Nets.		Night Lines.		Spears.		Freezers and Ice Houses.		Piers and Wharves.	
No.	Yards.	Value.	No.	Value.	No.	Value.	No.	Value.	No. Hooks.	Value.	No.	Value.	No.	Value.	No.	Value.
		$		$		$		$		$		$		$		$
....	.....	.....	5	1,250	....	.....	....	.....	.....	.....	....	.....	3	12,300	....	.....
....	1,300	61	165	73,220	....	.....	2	2	.....	.....	....	.....	21	6,575	....	.....
1	100	25	77	45,300	....	.....	....	.....	.....	.....	....	.....	18	20,500	11	4,800
7	2,100	575	69	27,400	....	.....	....	.....	.....	.....	....	.....	24	12,100	11	1,370
....	.....	.....	59	32,000	....	.....	....	.....	.....	.....	....	.....	26	14,350	....	.....
....	.....	.....	....	.....	....	.....	4	44	.....	.....	....	.....	21	8,550	13	3,050
43	15,881	6,185	2	1,000	....	.....	....	.....	2,400	72	....	.....	12	6,000	2	700
4	200	250	31	11,500	....	.....	26	45	925	5	....	.....	12	7,500	5	1,000
....	.....	.....	6	2,500	....	.....	6	.....	.....	.....	....	.....		1,300	....	.....
....	.....	.....	....	.....	....	.....	3	.....	4,850	.....	....	.....	....	.....	....	.....
55	19,671	7,096	414	194,170	....	.....	40	91	8,175	77	....	.....	141	89,175	42	10,920

during the year 1913, in the Public Waters of Lake Erie.

Sturgeon.	Eels.	Perch.	Tullibee.	Catfish.	Mixed and coarse fish.	Caviare.	Sturgeon Bladders.	Carp.	Value.
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs	$ c.
206	.....	35,527	.....	215	10,221	31	.....	.....	27,055 90
12,969	.....	99,552	42,668	13,256	320,832	1,147½	96	80,800	175,115 02
3,144	.....	240,453	.....	.....	125,300	158½	.....	.....	147,923 85
2,784	.....	129,367	.....	3,782	41,093	101	.....	67,000	145,291 42
2,123	.....	87,983	.....	1,600	46,625	266½	.....	.....	143,811 08
.....	.....	201,396	27	60	13,359	.....	.....	.....	290,411 71
3,780	.....	105,511	.....	5,612	193,257	132	.....	190,966	133,679 15
13,999	.....	50,029	15	557	37,766	343	92	35,140	97,531 92
1,663	.....	3,611	.....	1,434	9,580	81	.....	.....	10,957 04
7,308	.....	1,400	.....	.....	19,347	420	.....	35	6,119 40
47,976	.....	954,829	42,710	26,546	817,380	2,680½	188	373,948	1,177,896 49
$ c. 7,196 40	.....	$ c. 47,741 45	$ c. 2,562 60	$ c. 2,123 68	$ c. 40,869 00	$ c. 2,680 50	$ c. 112 80	$ c. 18,697 40	$ c. 1,177,896 49

ONTARIO

Return of the number of fishermen, tonnage and value of tugs, vessels and boats, the industry during the year 1913.

Number.	District.	Fishing material.								
		Tugs or Gasoline Launches.				Row or Sail Boats.			Gill-Nets.	
		No.	Tonnage.	Value.	Men.	No.	Value.	Men.	Yards.	Value.
	Lake Ontario.			$			$			$
1	Lincoln County	14	.....	7,225	4	1	59	.....	*58,703	.....
2	Wentworth County	3	.....	2,700	10	14	410	26	40,100	2,300
3	Halton County	16	.....	4,835	32	.....	.....	.....	92,000	4,200
4	Peel County	2	8	1,100	5	1	.....	2	11,135	600
5	York County	3	.....	775	6	4	475	9	13,700	1,750
6	Ontario County	1	.....	160	2	4	125	8	4,250	220
7	Durham County	1	.....	250	2	.....	.....	.....	3,000	300
8	Northumberland County	4	15	1,250	9	26	910	33	31,000	2,190
9	Prince Edward County	6	.....	1,150	9	85	6,944	163	196,419	5,735
10	Bay of Quinte (Proper)	37	53	3,482	65	180	7,526	293	71,100	3,219
11	Bay of Quinte (Eastern Channel)	34	3	1,655	48	.....	.....	...	66,840	790
12	Wolfe Island and Vicinity	6	5½	1,050	11	25	1,435	37	33,200	1,655
	Totals	127	84½	25,632	203	340	17,875	571	*621,447	22,959

*3 of these are machines used in the Niagara River.

Return of the kinds, quantities and values of fish caught

Number.	District.	Herring, salted.	Herring, fresh.	Whitefish salted.	Whitefish, fresh.	Trout, salted.	Trout, fresh.	Pike.	Pickerel or Dore.
	Lake Ontario.	brls.	lbs.	brls.	lbs.	brls.	lbs.	lbs.	lbs.
1	Lincoln County	.....	147,547	.....	25,578	.....	5,155	24,336	2,100
2	Wentworth County	.....	88,100	.....	21,640	.....	5,410	1,300	650
3	Halton County	.....	67,600	.....	6,250	.....	16,000	.....	....
4	Peel County	.....	8,002	.....	5,000	.....	5,530	300	.....
5	York County	.....	12,613	.....	24,330	.....	6,995	.....	.....
6	Ontario County	.....	820½	.....	3,985	.....	612	524	3
7	Durham County	.....	5,500	.....	4,600	.....	1,500	.....	.....
8	Northumberland County	13½	36,670	.....	9,927	.....	27,036	35,129	.....
9	Prince Edward County	10	25,000	3	154,746	100	363,735	34,766	.....
10	Bay of Quinte (Proper)	59	288,459	20½	127,812	.....	100	114,538	20,523
11	Bay of Quinte (Eastern Channel)	100	5,500	200	68,113	.....	90,149	1,850	2,592
12	Wolfe Island and Vicinity	.....	.....	.....	21,186	28	25,581	8,588	880
	Totals	182½	685,811½	223½	473,167	128	547,803	221,331	26,748
	Values	$ c. 1,825 00	$ c. 34,290 57	$ c. 2,235 00	$ c. 47,316 70	$ c. 1,280 00	$ c. 54,780 30	$ c. 17,706 48	$ c. 2,674 80

FISHERIES.

quantity and value of all fishing materials and other fixtures employed in the fishing in the Public Waters of Lake Ontario.

Fishing material.													Other fixtures used in fishing.			
Seines.			Pound nets.		Hoop nets.		Dip nets.		Night Lines.		Spears.		Freezers and Ice Houses.		Piers and Wharves.	
No.	Yards.	Value.	No.	Value.	No.	Value.	No.	Value.	No. Hooks.	Value.	No.	Value.	No.	Value.	No.	Value.
		$		$		$		$		$		$		$		$
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	1	.....	....	.....
6	7,200	340	....	.....	....	.....	1	5	600	6	50	75	†52	1,100	....	.....
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	15	1,245	....	.....
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	2	400	....	.....
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	....	.....	28	580	....	.....	.....	.....	....	.....	....	.....	....	.....
....	.....	.....	....	.....	58	978	....	.....	4,120	25	....	.....	7	90	....	.....
....	.....	.....	....	.....	266	7,520	....	.....	4,900	42	....	.....	....	.....	....	.....
....	60	10	....	.....	....	.....	....	.....	2,800	12	....	.....	....	.....	....	.....
1	10	5	....	.....	53	1,410	....	.....	400	30	....	.....	5	490	1	200
7	7,270	355	....	.....	405	10,488	1	5	12,820	115	50	75	†82	†3,325	1	200

†50 of these are spearing houses valued at $500

during the year 1913, in the Public Waters of Lake Ontario.

Sturgeon.	Eels.	Perch.	Tullibee.	Catfish.	Mixed and coarse fish.	Caviare.	Sturgeon Bladders.	Carp.	Smoked Herring.	Value.
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	lbs.	$ c.
.....	300	1,808	.....	.. . .	8,338	.....	.....	.....	.....	13,132 83
.....	2,100	1,300	.....	.....	1,950	....	.....	45,100	.....	9,822 50
.....	550	.....	.....	.....	.....	.....	.....	....	88,900	14,528 00
.....	300	1,010	.....	500	885	.....	.....	100	.....	1,634 85
.....	.....	.....	.....	.....	3,590	.....	.....	.....	.....	3,942 65
.....	.....	49	.....	.....	58½	.....	.....	.....	.....	548 32
.....	.....	.....	.....	.....	8,000	.....	.....	.....	.....	1,285 00
.....	3,300	.....	.....	24,712	43,460	.....	.....	....	.....	12,823 08
89	40,236	8,930	.....	15,210	54,064	1,000	.....	.....	.....	64,803 39
.....	57,390	84,422	3,000	194,997	184,315	.....	.....	1,900	.....	71,979 50
.....	71,222	1,590	.....	830	17,250	.....	.....	.....	.....	24,790 12
.....	15,877	25,800	.....	43,121	34,021	.....	.....	500	.....	13,150 09
89	191,275	124,909	3,000	279,370	355,931½	1,000	.....	47,600	88,900	232,440 33
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$		$ c.	$ c.	$ c.
13 30	11,476 50	6,245 45	180 00	22,349 60	17,796 58	1,000	.....	2,380 00	8,890 00	232,440 33

ONTARIO

Return of the number of Fishermen, tonnage and value of tugs, vessels and boats, fishing industry during the year 1913,

Number.	District.	Fishing Material.								
		Tugs or Gas line Launches.				Row or Sail Boats.			Gill-Nets.	
		No.	Tonnage.	Value.	Men.	No.	Value.	Men.	Yards.	Value.
	Inland Waters.			$			$			$
1	Frontenac County	.....	.....	.....	.....	81	847	124	3,380	264
2	Lanark, Leeds, Lennox and Addington Counties	6	.....	225	2	66	635	151	2,860	230
3	Renfrew, Carleton, Russell and Prescott Counties	5	.....	1,000	6	133	1,488	131	3,860	112
4	Lake Simcoe	4	.....	3,800	9	9	225	12	.....	.....
5	Nipissing and Timiskaming Districts	3	.....	650	6	2	40	2	3,900	340
	Totals	18	.....	5,675	23	291	3,235	420	14,000	946

Return of the kinds, quantities and values of fish caught

Number.	District.	Herring, salted.	Herring, fresh.	Whitefish, salted.	Whitefish, fresh.	Trout, salted.	Trout, fresh.	Pike.	Pickerel, or Dore.
	Inland Waters	brls.	lbs.	brls.	lbs.	brls.	lbs.	lbs.	lbs.
1	Frontenac County	.....	7,040	.....	.....	.....	.....	31,891	.....
2	Lanark, Leeds, Lennox and Addington Counties	.....	85	48½	1,582	5	.....	8,023	.....
3	Renfrew, Carleton, Russell and Prescott Counties	.....	.....	.....	.....	.....	.....	1,836	815
4	Lake Simcoe	.....	375	.....	5,354	.....	9,236	.....	.....
5	Nipissing and Timiskaming Districts	.....	1,940	.....	3,905	.....	1,500	8,320	9,990
	Totals	.....	9,440	48½	10,841	5	10,736	50,070	10,805
	Values	$ c.	$ c. 472 00	$ c. 485 00	$ c. 1,084 10	$ c. 50 00	$ c. 1,073 60	$ c. 4,005 60	$ c. 1,080 50

FISHERIES,

the quantity and value of all fishing materials and other fixtures employed in the in the Public Inland Waters.

Fishing material.													Other fixtures used in fishing.			
Seines.			Pound nets.		Hoop nets.		Dip Nets.		Night Lines.		Spears.		Freezers and Ice Houses.		Piers and Wharves.	
No.	Yards.	Value.	No.	Value.	No.	Value.	No.	Value.	No. Hooks.	Value.	No.	Value.	No.	Value.	No.	Value.
		$		$		$		$		$		$		$		$
11	123	135	....	.....	28	605	....	.....	400	.....	....	.....	....	.....	....	.....
2	40	.....	....	.....	80	1,179	13	40	7,000	.....	....	.....	24	750	....	.....
....	.....	.....	....	.....	13	110	8	16	10,660	250	....	.....	1	25	....	.....
6	2,000	880	....	.....	....	.....	....	.....	2,000	23	53	185	2	700	2	100
....	.....	.....	....	.....	1	.....	....	.....	.....	.....	....	.....	2	500	....	.....
19	2,163	1,015	....	.....	122	1,894	26	56	20,060	273	53	185	29	1,975	2	100

during the year 1913, in the Public Inland Waters.

Sturgeon.	Eels.	Perch.	Tullibee.	Catfish.	Mixed and coarse fish.	Caviare.	Sturgeon Bladders.	Carp.	Dog fish.	Value.
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	No.	$ c.
.....	7,406	4,475	.....	45,599	59,542	.....	.....	.....	.....	10,196 41
.....	36,461	3,819	.....	68,063	34,841	.....	.....	.....	.....	10,904 99
545	1,875	415	.....	9,850	62,285	.....	130	50	.....	4,426 13
.....	.....	17,678	.....	.....	79,678	.....	.....	116,262	.....	12,158 65
1,200	.....	100	1,167	900	4,252	.....	.....	.....	.....	2,841 72
1,745	45,742	26,487	1,167	124,412	240,598	.....	130	116,312	.....	40,527 90
$ c. 261 75	$ c. 2,744 52	$ c. 1,324 35	$ c. 70 02	$ c. 9,952 96	$ c. 12,029 90	.....	$ c. 78 00	$ c. 5,815 60	.....	$ c. 40,527 90

ONTARIO

Recapitulation of the number of fishermen, tonnage and value of tugs, vessels and boats, industry during

Number.	District.	Fishing material.								
		Tugs or Gasoline Launches.				Sail or Row Boats.			Gill-Nets.	
		No.	Tonnage.	Value.	Men.	No.	Value.	Men.	Yards.	Value.
				$			$			$
1	Kenora and Rainy River Districts	32	.....	17,743	64	43	8,700	97	111,900	12,565
2	Lake Superior	27	531	85,200	108	64	9,035	121	782,300	44,299
3	Lake Huron (North Channel)	38	491	89,875	159	70	30,108	122	860,850	51,487
4	Georgian Bay	57	109	50,910	155	93	6,224	123	1,075,250	83,408
5	Lake Huron (Proper)	25	193	31,850	89	66	8,540	97	583,900	32,393
6	Lake St. Clair, etc.	29	6	6,200	60	82	7,198	175	.....	.....
7	Lake Erie	203	1,241	286.755	615	175	10,716	309	565,395	109,186
8	Lake Ontario	127	84	25,632	203	340	17,875	571	*621,447	22,959
9	Inland Waters	18	.....	5,675	23	291	3,235	420	14.000	946
	Totals	556	2,655	599,840	1,476	1,224	101,631	2.035	*4,615,042	357,243

*3 of these are machines used in the Niagara River.

Recapitulation of the kinds, quantities and values of

Number.	District.	Herring, salted.	Herring, fresh.	Whitefish, salted.	Whitefish, fresh.	Trout, salted.	Trout, fresh.	Pike.	Pickerel or Dore.	Sturgeon.
		brls.	lbs.	brls.	lbs.	brls.	lbs.	lbs.	lbs.	lbs.
	Kenora and Rainy River Districts	.....	.....	.....	1,199,206	.....	90,058	692,854	879,955	89,730
2	Lake Superior	12	299,000	102	373,468	2,262	1,401,677	38,201	104,068	2,760
	Lake Huron (North Channel)	155	19,623	251	599.140	87	1,719,897	87,262	436,949	29.981
	Georgian Bay	177½	55,150	408	374,743	1,389½	930,880	36,983	45.621	6,889
	Lake Huron (Proper)	288	142,404	14	36,217	351	673,258	1,593	121,615	14,182
	Lake St. Clair, etc.	.....	100	.....	70,350	.....	.....	38,835	67,022	60,128
	Lake Erie	.....	11,608,428	204	1,938,992	.....	1,769	2,287,602	963.670	47.976
	Lake Ontario	182½	685,811½	223½	473,167	128	547,803	221,331	26.748	89
	Inland Waters	.....	9,440	48½	10,841	5	10,736	50,070	10,805	1,745
	Totals	815	12,819,956½	1,251	5.076,124	4,222½	5,376,078	3,454,731	2,656.453	253,480
	Values	$ c. 8,150 00	$ c. 640,997 82	$ c. 12,510 00	$ c. 507,612 40	$ c. 42,225 00	$ c. 537,607 80	$ c. 276,378 48	$ c. 265,645 30	$ c. 38,022 00

FISHERIES.

the quantity and value of all fishing material and other fixtures employed in the fishing the year 1913.

Fishing material.—*Continued.*													Other fixtures used in fishing.			
Seines.			Pound nets.		Hoop nets.		Dip or Roll nets.		Night Lines.		Spears.		Freezers and Ice Houses.		Piers and Wharves.	
No.	Yards.	Value.	No.	Value.	No.	Value.	No.	Value.	No. Hooks.	Value.	No.	Value.	No.	Value.	No.	Value.
		$		$		$		$		$		$		$		$
....	.....	.....	31	9,325	....	.....	....	.....	400	.....	....	.....	25	10,125	14	2,745
....	.....	.....	20	4,700	....	.....	....	.....	.....	.....	....	.....	14	10,200	7	7,900
....	.....	.....	97	28,000	....	.....	....	.....	.....	.....	....	.....	15	3,650	5	1,200
....	.....	.....	8	1,200	13	800	....	.....	.....	.....	....	.....	14	6,350	4	2,610
3	135	150	66	15,900	1	25	....	.....	.....	.....	....	.....	4	3,200	....	.....
44	5,047	2,325	12	2,900	164	9,550	31	970	4,850	162	....	.....	9	2,500	16	2,695
55	19,674	7,096	444	194,170	....	.....	40	91	8,175	77	....	.....	141	89,175	42	10,920
7	7,270	355	....	.....	405	10,488	....	.....	12,820	115	50	75	82†	3,325†	1	200
19	2,163	1,015	....	.....	122	1,891	26	56	20,060	273	53	185	29	1,975	2	100
128	34,286	10,941	648	253,295	705	22,757	97	1,117	46,305	627	103	260	333†	130,500†	91	28,370

†50 of these are spearing houses valued at $500.

fish caught during the year 1913.

Eels	Perch.	Tullibee.	Catfish.	Mixed and coarse fish.	Caviare.	Sturgeon Bladders.	Carp.	Smoked Herring.			Value.
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	lbs.	lbs.	lbs.	$ c.
.....	.....	177,379	17,006	217,002	2,350	128	.....	.....	.....	.....	312,589 84
.....	.....	873	.....	110,531	.....	.....	.....	.....	.....	.....	235,680 21
.....	7,804	21,135	2,506	443,491	252½	.....	.....	.....	.....	.....	317,273 69
.....	3,860	63,703	5,990	46,227	835	.....	.....	.....	.....	.....	169,264 62
3	49,358	243,800	184	59,858	967	7	1,600	.....	.....	.....	120,168 84
.....	75,492	20,050	70,428	508,109	326	.....	132,665	.....	.....	.....	68,844 74
.....	954,829	42,710	26,516	817,380	2,680½	188	373,948	.....	.....	.....	1,177,896 49
191,275	121,909	3,000	279,370	355,93½	1,000	.....	47,600	88,900	.....	.....	232,440 33
45,742	26,487	1,167	124,412	240,598	.....	130	116,312	.....	.....	.....	40,527 90
237,020	1,242,739	573,817	526,442	2,829,127½	8,411	453	672,125	88,900	.....	.....	2,674,686 76
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.			$ c.
14,221 20	62,136 95	34,429 02	42,115 36	141,456 38	8,411 00	271 80	33,606 25	8,890 00	.....	.....	2,674,686 76

Comparative Statement of yield for 1912-13, according to Districts.

	1912.	1913.	Increase.	Decrease.
Kenora and Rainy River District:				
Herring.....bbls.	.....	.....	.....	.....
Herring..... lbs.	.....	.....	.....	.....
Whitefish .....bbls.	.....	.....	.....	.....
Whitefish ..... lbs.	994,428	1,199,206	204,778	.....
Trout.....bbls.	1,000	.....	.....	1,000
Trout..... lbs.	55,643	90,058	34,415	.....
Pike ..... "	456,994	692,854	235,860	.....
Pickerel (Dore) ..... "	669,311	879,955	210,644	.....
Sturgeon..... "	117,933	89,730	.....	28,200
Eels ..... "	.....	.....	.....	.....
Perch ..... "	.....	.....	.....	.....
Tullibee ..... "	105,579	177,379	71,800	.....
Catfish..... "	28,450	17,006	.....	11,444
Mixed and Coarse fish ....., "	33,893	247,002	213,109	.....
Caviare ..... "	2,796	2,350	.....	446
Sturgeon Bladders..... No.	213	128	.....	85
Buffalo Fish..... lbs.	91,076	.....	.....	.....
Lake Superior:				
Herring.....bbls.	.....	12	12	.....
Herring..... lbs.	1,763,315	299,000	.....	1,464,315
Whitefish .....bbls.	.....	102	102	.....
Whitefish ..... lbs.	573,674	373,468	.....	200,206
Trout .....bbls.	690	2,262	1,572	.....
Trout..... lbs.	1,475,924	1,401,677	.....	74,247
Pike ..... "	122,631	38,201	.....	84,430
Pickerel (Dore) ..... "	217,847	104,068	.....	113,779
Sturgeon..... "	3,567	2,760	.....	807
Eels ..... "	.....	.....	.....	.....
Perch ..... "	.....	.....	.....	.....
Tullibee ..... "	550	873	323	.....
Catfish..... "	.....	.....	.....	.....
Mixed and Coarse fish ..... "	.....	110,531	110,531	.....
Caviare ..... "	.....	.....	.....	.....
Sturgeon Bladders..... No.	.....	.....	.....	.....
Carp..... lbs.	.....	.....	.....	.....
Lake Huron, North Channel:				
Herring.....bbls.	276	155	.....	121
Herring ..... lbs.	400	19,623	19,223	.....
Whitefish .....bbls.	$2\frac{1}{2}$	251	$248\frac{1}{2}$	.....
Whitefish ..... lbs.	660,160	599,140	61,020	.....
Trout.....bbls.	$1,002\frac{1}{2}$	87	$915\frac{1}{2}$	.....
Trout..... lbs.	1,690,708	1,719,897	29,189	.....
Pike..... "	68,516	87,262	18,746	.....
Pickerel (Dore) ..... "	424,556	436,949	12,393	.....
Sturgeon ..... "	22,018	29,981	7,963	.....
Eels ..... "	.....	.....	.....	.....
Perch..... "	11,454	7,804	.....	3,650
Tullibee..... "	3,260	21,135	17,875	.....
Catfish..... "	2,486	2,506	20	.....
Mixed and Coarse fish..... "	302,491	443,491	141,000	.....
Caviare ..... "	405	$252\frac{1}{2}$	.....	$152\frac{1}{2}$
Sturgeon Bladders ..... No.	.....	.....	.....	.....
Carp ..... lbs.	.....	.....	.....	.....
Georgian Bay:				
Herring.....bbls.	$1,123\frac{1}{2}$	$177\frac{1}{2}$	.....	946
Herring .....lbs.	67,350	55,150	.....	12,200
Whitefish. .....bbls.	40	408	368	.....
Whitefish.....lbs.	287,161	374,743	87,582	.....
Trout .....bbls.	$913\frac{1}{2}$	$1,389\frac{1}{2}$	476	.....
Trout .....lbs.	1,027,027	930,880	.....	96,147

Comparative Statement of yield for 1912-13, according to Districts—Continued.

—	1912.	1913.	Increase.	Decrease.
Georgian Bay—Continued:				
Pike....lbs....	34,326	36,983	2,657	.....
Pickerel (Dore)..... "	58,012	45,621	.....	12,391
Sturgeon..... "	976	6,889	5,913	.....
Eels..... "	.....	.....	.....	.....
Perch..... "	3,000	3,860	860	.....
Tullibee..... "	35,414	63,703	28,289	.....
Catfish..... "	1,067	5,990	4,923	.....
Mixed and Coarse Fish..... "	42,363	46,227	3,864	.....
Caviare..... "	100	835	735	.....
Sturgeon Bladders....No....	.....	.....	.....	.....
Carp....lbs....	8,100	.....	.....	8,100
Lake Huron (proper):				
Herring....bbls....	117	288	171	.....
Herring....lbs....	150,524	142,404	.....	8,120
Whitefish....bbls....	.....	14	14	.....
Whitefish....lbs....	38,738	36,217	.....	2,521
Trout....bbls....	638½	351	.....	287½
Trout....lbs....	631,225	673,258	42,033	.....
Pike..... "	752	1,593	841	.....
Pickerel (Dore)..... "	187,177	121,615	.....	65,562
Sturgeon..... "	48,663	14,182	.....	34,481
Eels..... "	405	3	.....	402
Perch..... "	61,499	49,358	.....	12,141
Tullibee..... "	277,200	243,800	.....	33,400
Catfish..... "	146	184	38	.....
Mixed and coarse fish..... "	90,373	59,858	.....	30,515
Caviare..... "	1,777	967	.....	810
Sturgeon Bladders....No....	11	7	.....	4
Carp....lbs....	100	1,600	1,500	.....
Lake St. Clair and Detroit River:				
Herring....bbls....	.....	.....	.....	.....
Herring....lbs....	.....	100	100	.....
Whitefish....bbls....	.....	.....	.....	.....
Whitefish....lbs....	158,442	70,350	.....	88,092
Trout....bbls....	.....	.....	.....	.....
Trout....lbs....	.....	.....	.....	.....
Pike..... "	37,339	38,835	1,496	.....
Pickerel (Dore)..... "	57,917	67,022	9,105	.....
Sturgeon..... "	48,818	60,128	11,310	.....
Eels..... "	.....	.....	.....	.....
Perch..... "	80,649	75,492	.....	5,157
Tullibee..... "	75	20,050	19,975	.....
Catfish..... "	51,396	70,428	19,032	.....
Mixed and coarse fish..... "	462,828	508,109	45,281	.....
Caviare..... "	1,635	326	.....	709
Sturgeon Bladders....No....	.....	.....	.....	.....
Carp....lbs....	73,060	132,665	59,605	.....
Lake Erie:				
Herring....bbls....	4,619	.....	.....	4,619
Herring....lbs....	13,041,418	11,608,428	.....	1,432,990
Whitefish....bbls....	1,720	204	.....	1,516
Whitefish....lbs....	2,236,428	1,938,992	.....	297,436
Trout....bbls....	.....	.....	.....	.....
Trout....lbs....	2,489	1,769	.....	720
Pike..... "	1,485,166	2,287,602	802,436	.....
Pickerel (Dore)..... "	975,180	963,670	.....	11,510
Sturgeon..... "	52,267	47,976	.....	4,291
Eels..... "	.....	.....	.....	.....

Comparative Statement of yield 1912-13, according to Districts.

——	1912.	1913.	Increase.	Decrease.
Lake Erie.—Continued:				
Perch.....lbs....	1,110,201	954,829	.....	155,372
Tullibee..... "	150	42,710	42,560	.....
Catfish..... "	52,267	26,546	.....	25,721
Mixed and coarse fish..... "	880,593	817,380	.....	63,213
Caviare..... "	3,430	2,680½	.....	749½
Sturgeon Bladders.....No....	652	188	.....	464
Carp.....lbs....	899,525	373,948	.....	525,577
Lake Ontario;				
Herring.....bbls....	51	182½	131½	.....
Herring.....lbs....	539,760	685,811½	146,051½	.....
Whitefish.....bbls....	355	223½	.....	131½
Whitefish.....lbs....	514,923	473,167	.....	41,756
Trout.....bbls....	180	128	52	.....
Trout.....lbs....	595,162	547,803	.....	47,359
Pike..... "	236,017	221,331	.....	14,686
Pickerel (Dore)..... "	75,126	26,748	.....	48,378
Sturgeon..... "	8,590	89	8,501	.....
Eels..... "	225,497	191,275	.....	34,222
Perch..... "	122,985	124,909	1,924	.....
Tullibee..... "	9,719	3,000	.....	6,719
Catfish..... "	387,855	279,370	.....	108,485
Mixed and Coarse fish..... "	373,300	355,931½	.....	17,368½
Caviare..... "	.....	1,000	1,000	.....
Sturgeon Bladders.....No....	.....	.....	.....	.....
Carp.....lbs....	36,170	47,600	11,430	.....
Herring, Smoked..... ".....	123,900	88,900	.....	35,000
Inland Waters:				
Herring.....bbls....	39	.....	.....	39
Herring.....lbs....	12,205	9,440	.....	2,765
Whitefish.....bbls....	.....	48½	48½	.....
Whitefish.....lbs....	2,388	10,841	8,453	.....
Trout.....bbls....	7	5	.....	2
Trout.....lbs....	6,361	10,736	4,375	.....
Pike..... "	31,459	50,070	18,611	.....
Pickerel (Dore)..... "	487	10,805	10,318	.....
Sturgeon..... "	6,400	1,745	.....	4,655
Eels..... "	26,680	45,742	19,062	.....
Perch..... "	3,391	26,487	23,096	.....
Tullibee..... "	.....	1,167	1,167	.....
Catfish..... "	107,728	124,412	16,684	.....
Mixed and Coarse fish..... "	145,155	240,598	.....	95,443
Caviare..... "	.....	.....	.....	.....
Sturgeon Bladders.....No....	.....	130	130	.....
Carp.....lbs....	123,871	116,312	.....	7,559
Dog fish..... "	4,200	.....	.....	4,200

Comparative Statement of the yield of the Fisheries of the Province.

——	1912	1913	Increase.	Decrease.
Herring.....bbls.....	6,225½	815	.....	5,410½
Herring.....lbs.....	15,574,972	12,819,956½	.....	2,755,015½
Whitefish.....bbls.....	2,117½	1,251	.....	866½
Whitefish.....lbs.....	5,466,342	5,076,124	.....	390,218
Trout.....bbls.....	4,431½	4,222½	.....	209
Trout.....lbs.....	5,484,539	5,376,078	.....	108,461
Pike..... "	2,473,200	3,454,731	1,081,531	.....
Pickerel (Dore)..... "	2,665,613	2,656,453	.....	9,160
Sturgeon..... "	309,232	253,480	.....	55,752
Eels..... "	252,582	237,020	.....	15,562
Perch..... "	1,393,179	1,242,739	.....	150,440
Tullibee..... "	431,947	573,817	141,870	.....
Catfish..... "	632,095	526,442	.....	105,653
Mixed and Coarse fish..... "	2,330,996	2,829,127½	498,131½	.....
Caviare..... "	9,543	8,411	.....	1,132
Sturgeon Bladders.....No.	876	453	.....	423
Carp..... lbs	1,140,826	672,125	.....	468,701
Herring, smoked..... "	123,900	88,900	.....	35,000
Buffalo Fish..... "	91,076	.....	.....	91,076
Dog Fish..... "	4,200	.....	.....	4,200
Total Barrels.....	12,774½	6,288½	.....	.....
Total Pounds.....	38,385,118	35,815,857	.....	.....
Total Decrease of Barrels, 1913	.....	.....	.....	6,486
Total Decrease of Pounds, 1913	.....	.....	.....	2,569,261

Statement of the yield and value of the Fisheries of the Province for the year 1913.

Kinds of Fish.	Quantity.	Price.	Value.
		$ c.	$
Herring.....bbls....	815	10 00	8,150 00
Herring.....lbs....	12,819,956½	05	640,997 82
Whitefish.....bbls....	1,251	10 00	12,510 00
Whitefish.....lbs....	5,076,124	10	507,612 40
Trout.....bbls....	4,222½	10 00	42,225 00
Trout.....lbs....	5,376,078	10	537,607 80
Pike..... "	3,454,731	08	276,378 48
Pickerel (Dore)..... "	2,656,453	10	265,645 30
Sturgeon..... "	253,480	15	38,022 00
Eels..... "	237,020	06	14,221 20
Perch..... "	1,242,739	05	62,136 95
Tullibee..... "	573,817	06	34,429 02
Catfish..... "	526,442	08	42,115 36
Mixed and Coarse Fish..... "	2,829,127½	05	141,456 38
Caviare..... "	8,411	1 00	8,411 00
Sturgeon Bladders.....No....	453	60	271 80
Carp.....lbs....	672,125	05	33,606 25
Herring, smoked..... "	88,900	10	8,890 00
Total.....	.....	.....	$2,674,686 76

Value of Ontario Fisheries from 1870 to 1913, inclusive.

Years.	Value.	Years.	Value.
	$	Brought forward.....	$ c. 19,397,564 00
1870.....	264,982	1892.....	2,042,198 00
1871.....	193,524	1893.....	1,694,930 00
1872.....	267,633	1894.....	1,659,968 00
1873.....	293,091	1895.....	1,584,473 00
1874.....	446,267	1896.....	1,605,674 00
1875.....	453,194	1897.....	1,289,822 00
1876.....	437,229	1898.....	1,433,631 00
1877.....	438,223	1899.....	1,477,815 00
1878.....	348,122	1900.....	1,333,293 00
1879.....	367,133	1901.....	1,428,078 00
1880.....	444,491	1902.....	1,265,705 00
1881.....	509,903	1903.....	1,535,144 00
1882.....	825,457	1904.....	1,793,524 00
1883.....	1,027,033	1905.....	1,708,963 00
1884.....	1,133,724	1906.....	1,734,865 00
1885.....	1,342,692	1907.....	1,935,024 90
1886.....	1,435,998	1908.....	2,100,078 63
1887.....	1,531,850	1909.....	2,237,544 41
1888.....	1,839,869	1910.....	2,348,269 57
1889.....	1,963,123	1911.....	2,419,178 21
1890.....	2,009,637	1912.....	2,842,877 09
1891.....	1,806,389	1913.....	2,674,686 76
Carried forward	$19,379,564	Total	$59,525,011 57

STATEMENT

of the number and value of the Tugs, Vessels and Boats, Nets, Spears, &c., used in the Fishing Industry of the Province of Ontario, during the year 1913.

——	Number.	Value.
		$
Tugs and Gasolines (2,655 tons)	556	599,840
Boats (Sail and Row).....	1,224	101,631
Gill-Nets.....	4,615,042 yds.	357,243
Seines (34,286 yds).....	128	10,941
Pound-Nets.....	648	253,295
Hoop-Nets.....	705	22,757
Roll and Dip Nets.....	97	1,117
Baited Hooks	46,305	627
Spears	103	260
Freezers and Ice-Houses.....	333	130,500
Piers and Wharfs.....	91	28,370
Total	.....	1,506,581

Number of men employed on Boats (Tugs and Gasolines).....	1,476	
" " " Boats (Sail and Row)	2,035	
	3,511	

Rolling a Macadam Road in Malahide Township, Near Aylmer.

ANNUAL REPORT

ON

Highway Improvement

ONTARIO

1915

PRINTED BY ORDER OF

THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO :

Printed by A. T. WILGRESS, Printer to the King's Most Excellent Majesty

1915

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To His Honour JOHN STRATHEARN HENDRIE, C.V.O., a Lieutenant-Colonel in the Militia of Canada, etc., etc., etc.

Lieutenant-Governor of the Province of Ontario.

MAY IT PLEASE YOUR HONOUR:

I herewith beg to present for your consideration the annual report of W. A. McLean, Commissioner of Highways, relating to Highway Improvement in the Province of Ontario.

Respectfully submitted.

(Signed) F. G. MACDIARMID,

Minister of Public Works.

To the Honourable F. G. MACDIARMID,

Minister of Public Works:

SIR,—I have the honour to transmit to you the annual report on Road and Bridge Construction in Ontario, having special reference to the work carried on by the several counties of the Province during the year 1914 under the Act to Aid in the Improvement of Public Highways.

I have the honour to be,

Sir,

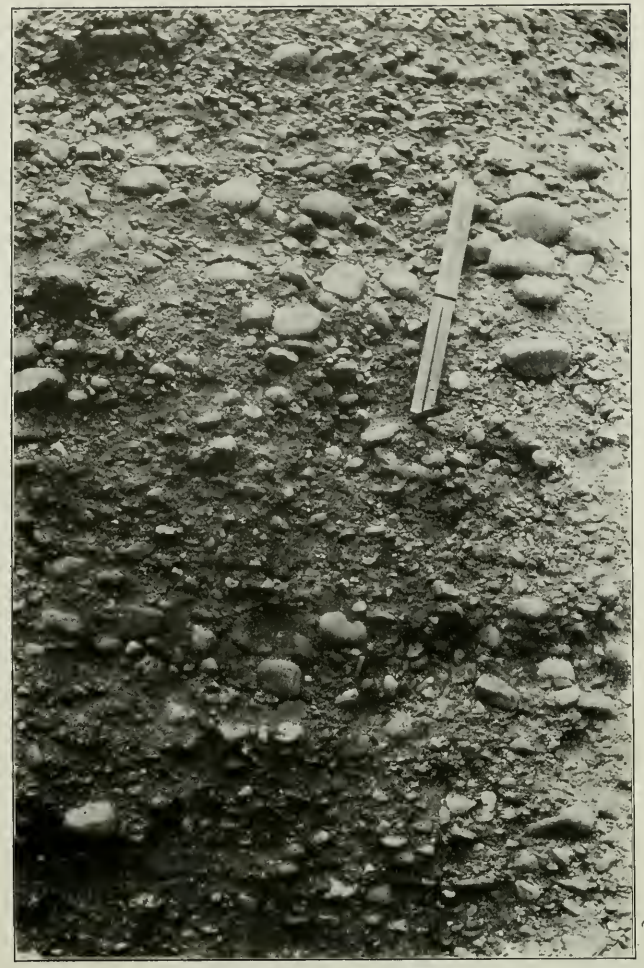
Your obedient servant,

(Signed) W. A. McLEAN,

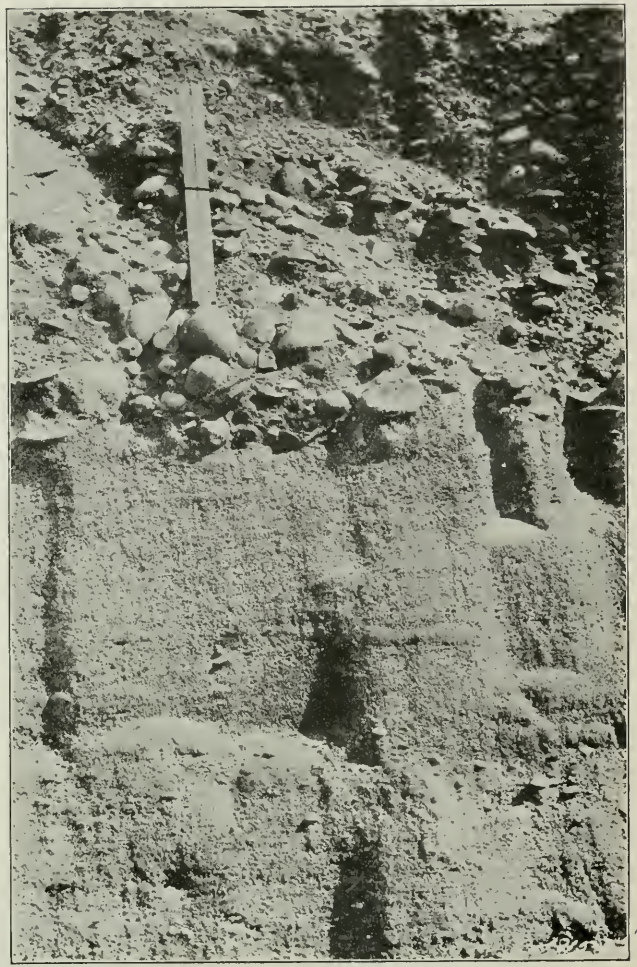
Commissioner of Highways.

Parliament Buildings, Toronto,

March 16th, 1915.



Good Gravel.
Uniform and not too fine. Note foot-rule.



Inferior Gravel.
Irregular and sandy. Note foot-rule.

ANNUAL REPORT

ON

HIGHWAY IMPROVEMENT

By W. A. McLean, Commissioner of Highways.

This Office has, during the year, continued its usual duties in relation to the work of highway improvement throughout the Province, which have included the administration of the Highway Improvement Act, under which subsidies are granted in aid of county road construction; consultation with township and town officials with respect to road and street improvement, model road construction, general educational measures in respect to roads, and the administration of provisions of the Municipal Act as to plans and specifications for steel and concrete highway bridges.

Further measures were undertaken, including a general survey of road conditions throughout the Province; a limited traffic census in relation to suburban roads; the outlining of systems of market roads for all counties not yet operating

Broken Stone for Haldimand County Roads.
Train of Wagons drawn by Traction Engine.

under the Highway Improvement Act; the testing of road materials, and the survey of the Toronto-Hamilton road. Certain of the work, however, has necessarily been delayed by war conditions.

Investigation has shown that there are in the Province approximately 55,000 miles of roads. About 20,000 miles are well graded earth roads; about 3,000 miles are surfaced with broken stone; and about 19,000 miles are surfaced with gravel. Many of the gravel roads are of inferior construction; nevertheless the proportion of surfaced roads is very creditable to the municipal organization of the Province. Unfortunately the improvement is not uniform, and the gravelled roads are largely confined to those areas in which gravel has been plentiful; while other districts are devoid of surface improvement other than grading and drainage.

The mileage of surfaced roads is encouraging, however, in that while many may be in a neglected state, or of inferior construction, they would more readily and cheaply respond to the systematic attention which it is the desire of this Office to encourage. The building of important market roads under county systems will be of more extended benefit by reason of even moderate improvement of the local feeders; while the development of a few roads of greater commercial importance between cities can be made to join up the entire system of roads throughout the Province in a most favourable manner.

I.

SUBSIDIZED COUNTY ROADS.

Construction on county road systems of the Province during 1914 had, prior to August, made exceptionally substantial progress, and promised to surpass the work of any previous year since the passing of the Highway Improvement Act. On the declaration of war, however, work was partially checked by some of the county authorities owing to uncertainty as to future financial conditions. In some counties it is found difficult to organize for important work in the spring and early summer months. During July and August, harvest operations attract all available labour; so that the months of September and October are usually the most productive period of the year in substantial road improvement, and during that period the greater part of the annual expenditure is made. It is, therefore, evident that the influence of the war on road construction of last year was very marked.

Expenditure of the year, as carried on in twenty counties operating under the Highway Improvement Act, is summarized as follows:—

Road construction	$594,367.12
Bridge construction	92,435.19
Superintendence	28,825.80
Machinery and equipment	23,186.00
Special county grants to townships, towns and villages	46,707.82
Total	$785,521.93

Provincial subsidies amounted to one-third of the total expenditure, or $261,840.61, which was paid in the Provincial financial year 1914-15.

The work comprised the following:—

Roads graded, drained and surfaced with broken stone	150.98 miles.
Roads graded, drained and surfaced with gravel	92.64 "
Total mileage metalled	243.62 miles.

In addition to the completion of over 243 miles of road, the work included 57½ miles of grading, 67 steel and concrete bridges, 108 concrete culverts, 601 tile culverts, and nearly 36 miles of tile underdrainage.

Expenditure on County Roads.

The following schedule shows in further detail the work and approved expenditure on County roads during 1914: and upon which Provincial subsidies were paid during 1915.

County.	Summary of work done during year.							Approved Expenditure for Year						
	Miles Graded.	Miles Stoned.	Miles Gravelled.	Tile Drain Rods.	Bridges.	Pipe and Tile Culverts	Other Culverts	Roads and Culverts.	Bridges.	Machinery and Repairs.	Special Grants to Towns, Villages and Townships	Superintendence.	Total Approved Expenditure.	Government Grant.
								$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Wentworth	.....	4.57	.....	.....	.....	26	.....	15,017 09	567 00	1,208 45	.....	1,800 00	18,592 54	6,197 51
Lanark	0.5	.....	.....	.....	2	.....	1	282 81	10,391 13	881 54	2,480 00	1,162 75	15,198 23	5,066 07
Simcoe	0.3	.....	1.56	.....	7	18	2	2,350 98	21,253 86	16 63	5,344 37	1,500 00	30,465 84	10,155 28
Wellington	4.4	3.07	3.62	74	8	59	7	15,602 16	8,902 06	2,627 80	173 90	1,820 41	29,126 33	9,708 78
Lincoln	.....	2.44	.....	6	2	13	25	6,860 47	2,964 15	81 39	.....	978 29	10,884 30	3,628 10
Oxford	.....	12.29	3.33	8,604	4	28	.....	41,419 58	2,587 37	3,817 09	6,073 14	1,668 07	55,565 25	18,521 75
Hastings	10.16	6.11	21.1	.....	7	40	.....	13,615 15	8,207 92	764 04	.....	1,600 00	24,187 11	8,062 37
Peel	1.5	5.9	2.3	.....	.....	21	6	27,210 27	2,642 39	302 84	.....	1,231 05	31,386 55	10,462 18
Middlesex	.....	1.93	20.85	1,032	8	6	.....	30,336 76	5,919 81	128 57	.....	1,666 00	38,051 14	12,683 71
Lennox & Addington	.....	4.74	0.39	.....	.....	21	2	10,039 36	196 25	146 92	2,026 80	1,095 78	13,505 11	4,501 70
Prince Edward	0.25	10.20	1.60	.....	.....	85	3	30,218 15	.....	3,323 86	.....	1,472 89	35,014 90	11,671 63
Halton	1.5	12.63	4.5	640	2	39	4	45,725 46	5,593 23	1,113 45	4,164 05	1,000 00	57,596 19	19,198 73
Perth	7.5	1.68	13.87	985	2	5	3	30,942 79	5,623 58	2,750 00	.....	1,010 00	40,326 37	13,442 12
Frontenac	.....	13.05	.....	.....	4	24	1	16,787 62	3,715 01	577 84	.....	812 10	21,892 57	7,297 52
Waterloo	4.13	1.54	7.56	88	2	16	2	15,764 15	2,227 27	1,723 11	7,500 00	1,531 45	28,745 98	9,581 99
Carleton	13.28	9.38	8.88	.....	6	31	.....	39,282 89	4,191 81	373 08	.....	825 26	44,673 04	14,891 01
Leeds & Grenville	.....	13.8	0.5	.....	1	38	3	25,361 18	643 90	228 72	18,245 56	1,669 26	46,148 62	15,382 87
York	.....	13.62	2.33	44	2	.....	25	86,200 66	2,952 40	730 28	.....	2,411 92	92,294 66	30,764 89
Haldimand	.....	8.58	.....	.....	4	114	4	35,536 94	1,760 37	1,925 59	700 00	1,921 34	41,844 24	13,948 08
Welland	13.94	25.45	0.25	25	6	37	20	105,813 25	2,095 68	464 80	.....	1,649 23	110,022 96	36,674 32
Totals	57.46	150.98	92.64	11,498	67	601	108	594,367 12	92,435 19	23,186 00	46,707 82	28,825 80	785,521 93	261,840 61

II.

GENERAL FEATURES OF COUNTY ROAD SYSTEMS.

The general features of county road systems organized under the Highway Improvement Act, and subsidized by the Province, are as follows:—

1. A county council is authorized to assume by by-law a system of roads for construction and maintenance; the Province contributing 40 per cent. of the expenditure on construction and 20 per cent. of the cost of maintenance.

2. A by-law adopting such a system may be passed by a two-thirds majority of a county council representing at least one-half of the total equalized assessment of the county.

3. Failing to receive a two-thirds majority of the county council, it may be carried by a simple majority, and a majority vote of the ratepayers.

TREES BY THE ROADSIDE.

Trees by the roadside are desirable, but objection is frequently raised because of the dampness created, and consequent injury to the road. To prevent such injury, proper pruning is necessary, and the illustration shows a row of trees with the lower branches removed, so that sunlight and drying winds can reach the road surface. Limbs should be cut close to the trunk of the tree so that bark will grow over the wound.

4. The roads assumed are usually such as will accommodate the greater part of local market travel, creating a system of main market roads. They are the roads radiating from local market centres and shipping points. They should be connected as far as practicable to serve the needs of through traffic of the locality. These county systems should not be confused with old county roads, many of which have ceased to be the roads of greatest travel; the trend of traffic is constantly changing through the building of new railroads, and the creation or growth of new local markets and shipping points.

5. The mileage of roads assumed by a county is usually from 12 to 18 per cent. of the total road mileage of the county.

6. The direction and superintendence of the work is placed in charge of a county engineer or capable superintendent appointed by the county council. A committee of the county council should co-operate with, advise and direct the road superintendent.

7. Roads are to be built in accordance with the regulations of the Department of Public Highways. The construction should be suited to local material and traffic. A standard type is regarded as a roadway well drained, graded to a width of 24 feet between ditches, with broken stone or gravel in the centre to a width of from 9 to 18 feet, and consolidated by rolling.

8. The cost varies with local conditions, but is, in general, proportionate to the width and kind of metal.

9. The system of roads assumed, and by-law fixing the plan of improvement, are subject to approval by Order-in-Council. A county council when considering the adoption of a county system or framing their by-law should communicate with the Department of Highways, in order that their plan may be prepared in accordance with the requirements and objects of the Highway Act.

10. When roads are assumed by a county council under this Act, township councils cease to have control over them, nor should they make any expenditure on them. The county council is thereafter responsible for construction and maintenance.

11. The Provincial grant is paid annually, and is based on a statement of expenditure for the year, submitted to the Minister of Public Works and Highways by the county council, and includes all costs of labour, material, engineering services, salary of road superintendent, machinery, and bridges on the designated system of county roads.

12. The county council may finance their work by issuing debentures for a term not exceeding thirty years; or by sums raised from year to year in the annual county rate.

13. The cost of purchasing and reconstructing toll roads may be included in the expenditure.

14. Statute labour along the roads belongs to township councils who may have it worked out on adjoining roads, or may wholly commute it and spend it on other roads. If the townships so determine, the fund raised by commuting statute labour may be transferred to the county to be used in repairing the county roads or in keeping them open in winter.

15. The county council may by by-law make grants to towns and villages not separated from the county, for the improvement of extensions or connecting links of county roads in such towns and villages, and certain of such grants may be included in the statement of annual expenditure. Grants eligible for a Provincial subsidy are those made to villages having a population of 1,500 or less; and those made to municipalities with a population of over 1,500 and less than 3,000, provided the improvement is carried out on suburban streets.

III.

ADVANTAGES OF COUNTY ROAD ORGANIZATION.

County control of main market roads is sound in principle, was recommended by the report of the Highway Commission and is retained under the revised High-

way Improvement Act of Ontario. Wherever systems of good roads have been created—in England, France, or in the United States—it is found necessary to classify the roads and place the several classes under separate authorities for construction and maintenance. It is not practicable for township organization alone to build and control all roads. With little exception the only substantial progress in road construction to-day is being made under county road systems. Where roads are wholly under township control, the experience is general that the more heavily travelled of them are growing worse rather than better.

County road management, it is true, is not always above criticism; but no governmental organization can be perfect and without defects. As a rule, some experience is needed to show what organization is required, why it is needed, and what it should accomplish. Changing conditions develop new requirements. The county road system, however, offers opportunity for a good and effective organization and should be moulded and developed with a progressive spirit.

MACADAMIZING LUNDY'S LANE, WELLAND COUNTY.

Adjacent to Niagara Falls.

There are various reasons why it is advisable to establish systems of county roads, some of the advantages being summarized as follows:—

1. It sets aside a limited mileage of roads for immediate improvement. There must be a starting point; all the roads of the Province cannot be built at once. A limited plan of roads is determined for special effort, and such as can be completed in a definite period, say ten years.

2. Expenditure can be concentrated on substantial construction. If roads are all under one body, such as a township council, the mileage is too great to cover in a definite period, so the expenditure is scattered over all roads in small amounts, and little or nothing of a permanent kind is accomplished.

3. Roads can be built to suit the traffic over them. Roads forming a county system should be so selected as to location that they will serve all parts of the county. They thus become the trunk roads of the locality in reaching local markets and shipping points, and can be adequately built to serve effectively the greater traffic on a uniform plan.

4. Continuous routes are provided for the heaviest traffic of the locality. Under township control, roads are improved in disjointed patches, usually with a view to improving the worst places first—but neglecting the needs of traffic. To provide adequately for traffic means the greatest benefit to the greatest number.

5. Township councils are relieved from the cost of maintaining roads of heavy traffic, and can consequently spread their expenditure more effectively over the greater mileage of roads carrying light traffic.

6. Adequate outfits of road machinery can be provided such as townships, working separately, could not supply.

7. A better class of supervision and workmanship can be had, growing out of continuous employment and experience.

8. Just as superior construction can be had under county control, so can better maintenance be provided, and largely for the same reasons.

9. In a general sense, the construction of substantial roads is too big a task for many township councils to organize and finance. Township councils are too close to the ratepayers; are too subject to personal influence and the consideration of votes. County councils are not wholly immune (nor is it desirable that they should be), but they are one step farther from influences such as tend to inferior and scattered work.

IV.

ROADS ASSUMED BY THE COUNTY.

Some misconception exists as to the roads which should be included in a county system. County systems do not mean that they shall be composed of a few routes through the county from east to west and north to south. Nor need they be made up of former county roads or toll roads built for the through traffic of half a century ago.

Present-day requirements should be considered. County road systems should comprise the local market roads, whether they do or do not make a series of through routes. They should be the main roads for farm traffic, usually radiating from local markets and shipping points. More often than not, they should be at right angles to lines of railways rather than parallel to the railways. They are the roads on which farmers should concentrate their expenditure for their own traffic. The county road systems are paid for largely by the farmers, and the Provincial grant to county roads is intended to aid in the construction of leading farm roads such as the farmers themselves wish to build.

V.

LOCAL ADJUSTMENT.

The Highway Act is flexible in character, and can readily be adjusted in an equitable manner to all local conditions, so that each municipality will receive a fair amount of expenditure proportionate to assessment or other scale that may be adopted. The mileage of roads in each township may be balanced according to

local cost of construction. Thus, in one township where stone roads are built, a less mileage will be assumed than in a township where roads are more cheaply built of local gravel. In cases, certain townships may be omitted from the scheme, and the county rate for roads not applied to them; or special grants to equalize cost may be made.

It is well recognized that, by road improvement, the value of adjacent property is increased; so that a suitable increase in assessment provides that the property along the roads will meet a special proportion of the cost. A full understanding of the Act will indicate a very equitable method of organization, depending solely for its success on the efficiency of administration in each county where a system of county roads is adopted.

Model Road in Malahide Township.

Broken stone 18 feet in width, treated with asphaltic oil; 27 feet between ditches.

VI.

SUPERVISION OF WORK.

One of the first duties of a county council, when a county road system has been established under the Highway Improvement Act, is to select a road superintendent. The work is carried on by the road superintendent, under the direction of the council and the Road Committee of the council. Too much care cannot be taken by the council in the selection of the superintendent. His qualification for the work, and close application to its management, more than any other factor, will determine the degree of success attained. Good business management, with thoroughly practical ideas and methods, are essential. The superintendent

is not required by the Act to be an engineer; but, if he is not such, occasional engineering services will be required, especially in bridge construction and details of grading. The cost of management is not great, and, compared with ordinary township methods, is one of the most profitable items of expenditure. Experienced supervision and skilled workmen are gradually trained—largely the secret of good roads wherever they are found.

VII.

COST OF COUNTY ROADS.

The roads commonly built under county road systems are not necessarily expensive. They are usually gravel roads, or broken-stone roads, well graded and

Malahide Township Road, Before Improvement.

drained—such as serve the needs of farm traffic. Preferably material of the locality, gravel or broken stone, is used. If there is no local material, and it has to be brought in by rail, the cost is greater—but is shared by the Province.

A number of districts in Ontario, such as portions of York, Peel, Halton, Welland, Essex and Kent, have no local material for road-making. In such cases an entirely new road must be built, often on a clay subsoil, and freight rates on stone must be added—all tending to higher cost, and amounting to from $4,000 to $8,000 per mile.

In other districts, however, such as Frontenac, Lanark or Hastings, there is an abundant supply of stone on or close to the road, and frequently the task is one of regrading and putting a surface over an old stone or macadam road. In such cases, a cost of $2,500 or $3,500 per mile is an ordinary expenditure.

Certain districts, on the other hand, have an abundant supply of gravel. Many of the roads have been gravelled from time to time and a good foundation has been

made. In such cases, the work usually consists of removing sod shoulders, improving the drainage, and adding a new surface of gravel—costing from $1,000 to $2,000 per mile for substantial work suited to local traffic.

A standard form of construction consists of an earth grade, twenty-four feet between shoulders, outside of which are the open drains. In the centre of the grade is placed, for a "single track" road, gravel or stone to a width of ten feet, and a depth varying from six to twelve inches, according to the traffic, subsoil and existing foundation. Good grading and drainage are of first importance. The road should be rolled with a ten-ton steam roller to complete for traffic. If the road is on an important line of through traffic, or adjacent to a city, the earth grade should be twenty-seven feet wide instead of twenty-four, and provision made for a "double-track" of gravel or stone, eighteen feet wide. This, however, is rarely necessary. A single track of metal nine or ten feet wide may first be laid, and later widened to eighteen feet as traffic increases.

VIII.

FINANCING COUNTY ROAD SYSTEMS.

Alarming but inaccurate statements are met with from time to time as to the cost and debt accruing from county road systems. In financing the work, some counties levy an annual rate on the equalized assessment to meet the yearly expenditure. Others obtain the necessary funds by the issue of debentures. The sentiment of some localities is strongly opposed to the creation of municipal debt; but, by a reasonable compromise, a sound scheme of finance can usually be reached, such as will be practicable, fair, and will not unduly retard progress.

The construction of a system of county roads should not be considered solely with regard to the total cost in a term of years, but rather from the standpoint of the annual cost. Road improvement is a process of development which will necessarily extend over a long term of years, and is a perpetual charge rather than a definite capital outlay.

A county rate of 1½ mills on the equalized county assessment should provide a satisfactory annual fund for expenditure on county roads, and should not be beyond the ability or willingness of any county in the Province.

For example, to levy a rate of 1½ mills would create an annual expenditure, for each $10,000,000 of assessment, as follows:—

County rate—1½ mills, would produce	$15,000
Raised by issue of debentures to meet cost of bridges and permanent construction	6,000
Provincial subsidy, 40 per cent. of total expenditure	14,000
Total for year	$35,000

At the end of ten years the net result to the county would be a plan of road improvement representing an asset of $350,000, with a debenture debt of $60,000.

The objection to an annual levy alone is that, without imposing an objectionably heavy tax, insufficient funds are provided; progress is slow, and the gradually increasing demands for maintenance tend to further retard progress of construction. Public dissatisfaction arises from the fact that roads are not being built rapidly enough, maintenance of roads (built and not yet built) is neglected, and still a substantial tax is being paid. Further, by the annual levy alone, the people of to-day are paying for benefits to which the future should fairly contribute.

The objection to construction solely by the issue of debentures is that property owners of the future may be called upon to pay in part for benefits which they do not receive; while a considerable part is absorbed by interest charges. The sentimental objection to municipal debt is also strong in some localities and must be considered. Further, the immediate improvement of the roads is secured with so little added burden of taxation that succeeding councils fear to levy a reasonable annual rate for maintenance. Much depends on the term for which debentures are issued. The Act permits a period of thirty years, but, if confined to ten or twenty years, a sounder basis is attained.

As stated in a previous paragraph, a compromise, a union of the two, an annual levy supplemented by a debenture issue, affords a reasonable and sound method of finance such as will not retard necessary progress, will permit proper maintenance, will not unduly burden the present or future, and will not create an objectionably large municipal debt. By meeting part of the cost of construction by an annual levy, and part by the issue of debentures, the most satisfactory results can be attained. Just what part should be met by the issue of debentures may be estimated from several standpoints, such as: (1) the permanent part of the work; (2) the ultimate cost of maintenance; (3) the ability and willingness of the people of the county to contribute by direct tax.

(1) Certain parts of the work may be considered permanent, such as concrete bridges, grading, hill-cutting and drainage. The cost of such permanent construction may be estimated, and raised by the issue of debentures; while a further amount to construct, maintain and meet the annual payments on the debentures may be met by annual levy.

(2) The probable cost of maintenance for the completed system may be estimated, and, together with the annual payment on debentures, this sum may be raised as soon as the county system is assumed. The cost of maintenance for the first few years is small, and the difference can conveniently be put into construction, to be supplemented as needed by funds raised by the issue of debentures. As maintenance costs increase, a larger amount will be needed from the debenture fund—but the total debt need be comparatively small.

(3) In case the ability and willingness of the people permit, a still larger sum than is ultimately needed for maintenance may be raised when the system is first assumed, thereby still further reducing the necessary debenture debt.

Broadly, when a county adopts the policy of raising a substantial sum annually (to be supplemented, as required, from debenture issues), the difficulty of financing the work is by no means burdensome, and the method is financially sound above all criticism.

IX.

HIGHWAY LEGISLATION IN 1915.

The highway legislation of 1915, as contained in the Ontario Highways Act, is exceedingly important. It was based on the findings of the Royal Commission appointed in 1913, and whose report was presented to the Legislature in 1914. The principles which it embodies are fundamental to the development of a general system of good roads for the Province, and such as will benefit not only the main highways, but also the chief market roads and local feeders.

X.

CITIES CONTRIBUTE TO COUNTY ROADS.

A principle affirmed by the Ontario Highways Act is that cities should contribute to the construction and maintenance of main roads, and also to leading market roads adjacent to the city.

In the American States, cities are not separated from township and county organization as in Ontario, while State revenues are raised by direct taxation on assessment. As a result we find that the cities in New York State are paying 85 per cent. of the cost of the State roads. The assessment of Detroit is 85 per cent. of the total assessment of Wayne County; so that Detroit is paying 85 per cent. of the cost of the concrete roads of the county. The city of Cleveland is paying

TORONTO-HAMILTON HIGHWAY—COMPLETED SECTION.

$800,000 annually for roads outside the city. The city of Boston is paying 65 per cent. of the expenditure on the State roads of Massachusetts. Similarly it will be found that, wherever striking advancement has been made in the construction of main roads in any country, financial support has, directly or indirectly, been substantially drawn from the cities.

Roads may, in general, be divided into three classes, viz.:—

(1) Main roads between cities or other important objective points.

(2) Market roads radiating from market towns and shipping points, and carrying the accumulated traffic of the district.

(3) Local feeders, each carrying only the traffic which originates on the road itself.

It is to the two former classes that cities will be required to contribute; in the case of main roads by assessment through special commissions, in the manner of the

Toronto-Hamilton highway; and in the case of market roads, through county councils, the expenditure to be confined to a reasonable suburban area.

Under the new Act, a county council having a system of county roads under the Highway Improvement Act may apply to the Provincial Government to have any city within the county brought within the scope of the Act. Upon direction by Order-in-Council, a city is required to appoint a commissioner, the county appoints a representative, and the two select a third commissioner. It is then the duty of a commission so formed to define the county roads to which the city will contribute and to direct the expenditure thereon. For such suburban roads the Provincial subsidy for construction will be 40 per cent., and the county and city will each contribute 30 per cent.; and for maintenance, 20 per cent. by the Province, and the county and city each 40 per cent. Adjacent to cities of 50,000 population or over, five commissioners will be selected instead of three: two by the city; two by the county, and the four choose the fifth commissioner.

Main roads adjacent to cities, owing to concentration of traffic, are always expensive to maintain; or rather are usually in an inferior condition owing to a neglect to provide sufficient funds to adequately maintain them. This condition reflects the benefit which such roads are to the city, and the consequent duty of the city to assist in their maintenance.

It is clear also that if a farmer with one family on a one-hundred acre farm is required to contribute to the cost of a market road three miles distant from his farm, it is equally just that the 10,000 inhabitants of a city grouped within an area of 2,000 acres should contribute to the cost of main roads immediately entering the city; over which necessary produce comes to the city, over which merchandise passes on the return journey—over which a valuable part of their daily business flows.

The history of road development in every country shows that main roads cost too much to be built at the expense of rural communities only; and as a matter of self-interest in improving local conditions as well as in promoting national development, it is desirable that the provisions of the Act respecting city support should be adopted.

XI.

PROVINCIAL SUBSIDY TO COUNTY ROAD CONSTRUCTION.

The Provincial subsidy to county road construction (the improvement of leading market roads radiating from towns and shipping points) has been increased from one-third to 40 per cent. under an Act of 1915. This is a very substantial measure of Provincial aid, appropriated in such a way as to produce the most effective and general benefit. Market roads are used by all; local feeders are used only by the few. The durable construction is sought of roads used by the greatest number.

It should be made clear that the Provincial subsidy is a percentage of the total expenditure; not a percentage of the county contribution. Thus the effect of the grant is that when:

The County raises	60 cents
The Province contributes	40 cents
The County spends	One dollar

The increased subsidy should be ample to encourage all counties in the Province to undertake systems of county roads, and a very sound basis of municipal finance is afforded.

XII.

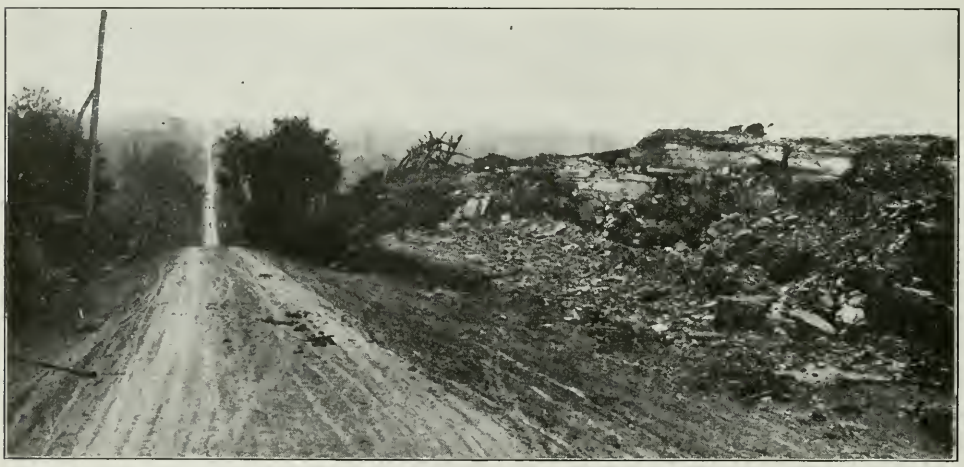
PROVINCIAL SUBSIDY TO COUNTY ROAD MAINTENANCE.

The Ontario Highways Act of 1915 authorizes a Provincial subsidy of twenty per cent. to encourage the more satisfactory maintenance of county roads; and payable in the same manner as for construction.

It has been clearly apparent from past experience in Ontario, and from the general experience of various states and countries, that provision for construction should be accompanied by provision for repair and maintenance.

No type of road is permanent in the sense that it is indestructible. A substantial foundation, an adequate earth grade and good drainage, with concrete culverts and bridges may be regarded as permanent; but the road surface is subject to constant wear which necessitates constant repair and maintenance.

Roads deteriorate very rapidly if neglected, for they are subjected to a severe test of weather and wear. The road crust, resting as a thin covering on the



Hill on the Portland Road, Frontenac County.

Stone quarried from the crest of the hill was used in the construction of the road.

ground, is subjected to the full extent to the destroying action of rain, snow, frost, freshet, drought, the steel-shod feet of horses, narrow steel tires, rapid motor traffic, all combining powerful forces to flatten, rut and shatter.

The maintenance of a road should begin the day after construction has been completed. In England it is not considered that construction is ended for three years after the contractor has left the work. Settlements unavoidably take place; occasional sections refuse to bond; drainage can only be perfected after close observation. A road is never in greater need of maintenance than during the first year after construction.

Maintenance is a broad term including much more than mere repair. To repair a road is little more than fill the ruts and depressions; to see that existing drains are kept open and free from obstruction; and that the earth shoulders are scraped and levelled as frequently as may be necessary. Maintenance implies not only that holes and depressions will be promptly filled, and that minor repairs will be effectively carried on, but also that the uniform wear of the road will be restored from time to time, so that the thickness of the road crust

will not be allowed to diminish, becoming thin and weak. Instead of being neglected in this regard, instead of the road crust being permitted to become too thin, there should be a general application of new broken stone, from time to time. Increasing requirements of traffic should be recognized, and instead of becoming thinner, the effort should be to gradually increase the thickness of the crust, and to widen it as traffic may require. The road is thus maintained as a permanent asset.

A proper policy of repair and maintenance will provide that:—

(1) There will be a continuously good road surface.

(2) The road crust will in no case be allowed to be broken through.

(3) The hollows, wheel tracks and depressions will be restored as soon as they appear.

(4) Repair will be carried on promptly and systematically, by section men employed as soon as the road is built.

(5) The thickness of the road crust will be maintained by general applications of stone from time to time.

(6) Growth of traffic will be provided for, by gradually increasing the thickness and width of the road crust.

(7) Main roads will be oiled, tarred or otherwise treated to preserve the surface and lessen dust.

(8) Earth roads should be systematically maintained by use of the log drag.

Such a policy will permit the construction of cheaper and narrower stone roads at first. The initial expenditure can be kept at the lowest amount, while the future can, by annual but not burdensome rates, take care of wear, provide for increasing traffic, and at the same time preserve the capital investment.

The organization for maintenance should ordinarily be under the control of the municipal or governmental body through which construction was carried on, since the same reasons requiring classification for construction are applicable to maintenance. This principle is, in general, followed in the countries which have produced good roads, and would appear applicable to Canada.

Road repair should be continuous and immediate. Defects should be remedied as soon as they appear. To this end the patrol system, as applied in England, France, New York State and elsewhere, is the most logical method. One man is given a section of road to which he devotes his entire time for about ten months of the year, in looking after drainage, and in filling ruts and holes as they appear. A depression, which at first can be filled at a cost of a few cents, can readily become a matter of dollars when neglected.

These men, kept permanently employed in other countries, become expert, take a pride in their work; and to them are largely due the magnificent roads which are so often believed impossible to attain in Canada. We cannot import roads from France, Germany and Scotland, but we can adopt the methods which have created them, of which the patrol system, giving immediate and continuous repair, is a leading characteristic.

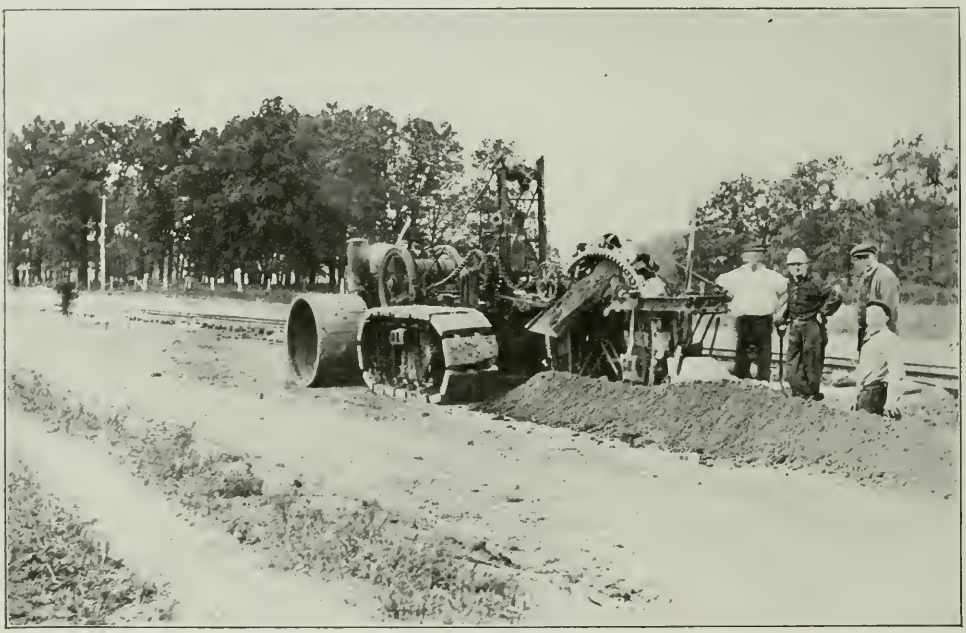
The length of road which one man can keep in repair depends largely on the type of construction, character and amount of traffic, weather and climatic conditions, quality of material and workmanship used in construction, and the condition of the road at commencement of patrol work. From three to ten miles have commonly been taken care of by one man. Supplied with piles of new material placed along the roads at convenient intervals, a patrol man can, with a horse, wagon and a few simple tools, do much to maintain for a small annual outlay, the roads which have been previously built at a large cost.

XIII.

DUTIES OF PATROLMAN.

The patrolman's primary duty is to keep the travelled surface in good condition, but there are other duties for which he should be responsible. His chief duties should be:

(1) To repair the road surface.
(2) To rake off loose stones and gravel.
(3) To clean out ditches and their outlets.
(4) To keep culverts free from obstruction.
(5) To cut and burn weeds.
(6) To repair guard rails.



DITCHING MACHINE FOR TILE DRAINAGE, SIDE VIEW.

Used in Ojibway, Essex County.

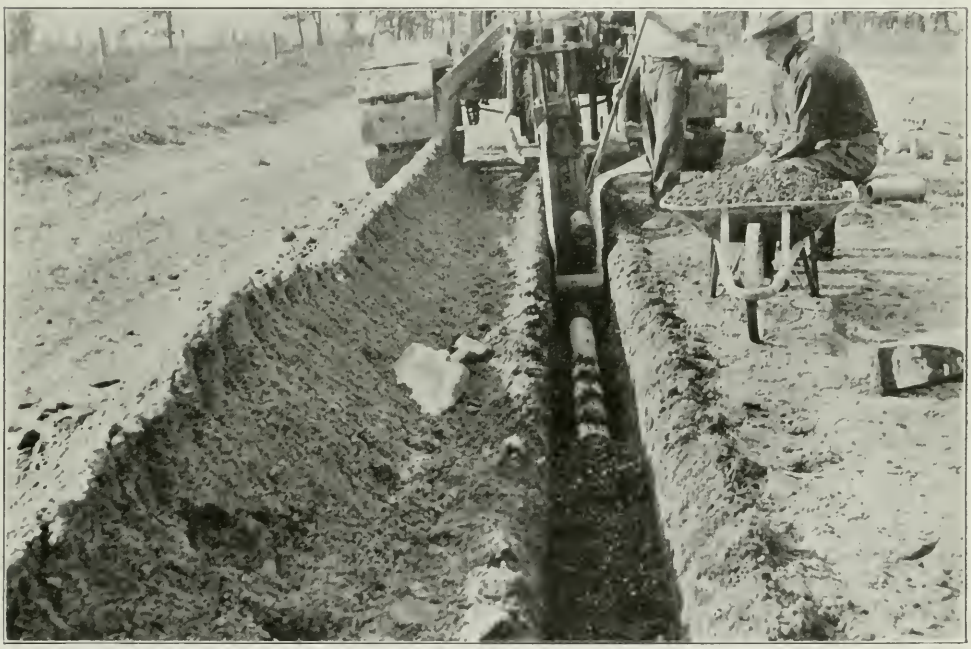
(7) To periodically inspect bridges and culverts, and immediately report to the county road superintendent any defects which he himself cannot remedy.

The employment of men in pairs, with a single horse and light wagon, is frequently to be recommended. Two men working together can very often make more than twice the progress, and at considerably less than twice the cost of one man and horse, while there is a tendency to greater contentment and efficiency produced by companionship.

To make a success of patrol work the men must be selected and adapted to the work. At least one man (who will act as foreman) must be able to think for himself, as on him will rest the responsibility of seeing that both are kept employed, and that all labour is put to the best use. It is possible on work of this kind to "fritter away" a lot of time and still appear busy; therefore the foreman

should be able to distinguish between necessary and unnecessary work. The men should be assured of permanent employment, so long as their services prove satisfactory. In patrol work, as in other branches of road construction, increased experience means increased efficiency and greater value. By knowing that their work will last as long as they desire it and prove themselves capable, the men will be induced to take a greater interest in it than if they know it to be only temporary.

The work, as previously stated, is influenced by so many variables as to make a close estimate impossible, but to give an idea of what may be expected, it may be stated that two men with single horse and wagon, commencing on a properly constructed road in good condition, and working full time, should be able to patrol sections about as follows:—



Ditching Machine for the Drainage.

Rear View.

1. Waterbound macadam road:—

(*a*) Ordinary county roads, light to moderate traffic—12 to 15 miles.

(*b*) More heavily travelled county roads—8 to 12 miles.

(*c*) County roads approaching large towns and small cities—5 to 8 miles.

(*d*) County roads in the vicinity of large cities, and heavily travelled interurban roads—2 to 5 miles.

2. Bituminous macadam, or waterbound macadam with bituminous surface:—

(*a*) Lightly travelled county roads—15 to 20 miles.

(*b*) Moderately travelled county roads—8 to 15 miles.

(*c*) Roads approaching small cities—5 to 10 miles.

(*d*) Roads approaching large cities and heavily travelled interurban roads—3 to 6 miles.

Each man should be equipped with the following tools, which should always be carried on the wagon:—

Square-nosed shovel.
Round-nosed shovel.
Pick.
Rake.
Tamping iron.
Coarse broom.
Scythe.

The wagon should have a specially constructed box divided into compartments for stone, screenings and tools. In the case of repairs to bituminous-surfaced roads, the compartments will be used for stone chips, tools, and fuel for the heating kettle.

The cost of operations will include the wages of the men and cost of materials used. These cannot be definitely stated, and the amount of stone used for repairing may be expected to vary from 10 cubic yards to 100 cubic yards per mile per annum. The annual cost of repairs, in general, may be expected to range from 3 per cent. to 6 per cent. of the original cost of the roads.

It is not to be expected that patrol work will eliminate the necessity for periodic resurfacing, but it will postpone it for many years. Modern practice is to allow the road surface to wear down a certain amount and then renew it, the patrol work being for the purpose of arresting undue wear in any one place and to correct ruts or depressions in their incipient stages. In the case of bituminous-surfaced roads, if the base has been properly constructed, and the surface systematically maintained, there should be little necessity for work, as far as the travelled portion of the road is concerned, other than the prompt repair of spots where the bituminous coat has worn through.

XIV.

MAINTENANCE AND REPAIR.

The distinction between the meaning of repair and of maintenance should be well understood in any examination of the comparative costs of various types of road for a given term of years.

"Repair" applies only to the patching of roads: the filling of holes and of wheel tracks. In the case of a brick pavement it may mean the replacing of a few bricks here and there or the restoration of a yielding foundation. In the case of a concrete road it would apply only to the patching of holes and joints or the clearing of ditches, culverts and drains.

While "repair" in all cases implies only necessary patching to keep the surface of the road smooth, the term "maintenance," on the other hand, will include "repair" and also the additional expenditure necessary to restore the road from time to time to its original thickness and condition at the time of construction. A macadam or gravel road is maintained from time to time by recharging the surface with new material to replace that which has worn away. A brick pave-

ment, on the other hand, cannot be so maintained, but when the surface is worn out, the old brick must be removed and the entire surface relaid. Similarly a sheet asphalt surface is, from period to period, wholly removed from the concrete foundation and a new covering of the original thickness is laid.

"Maintenance," therefore, includes not only "repair" but also an annual charge equivalent to the depreciation of the pavement, such annual charge for depreciation being dependent upon the life of the pavement; or in the case of a macadam or gravel road, it is the periodic cost of recharging the surface so as to restore it to its original condition.

It is, therefore, to be considered that when comparing the cost of macadam or gravel roads with the cost of a pavement for a period of years, the expenditure for maintaining the macadam or gravel must be offset not only by a charge for annual patching and repairing the pavement but also a charge for depreciation of the pavement.

On the York Road in Lennox and Addington.

XV.

MAIN ROADS.

Organization is provided in the Ontario Highways Act for the construction of main roads, for which there has been a growing demand.

A main road may be interpreted as one running directly between two important terminal points or cities, and therefore passing through a series of municipalities. Such series of municipalities may petition the Provincial Government for construction as a Main Road; and if the petition is endorsed by three-quarters of the municipalities affected, the Government will make surveys, prepare specifications and appoint a special board of commissioners to take charge of the construction and maintenance of the road. The cost in the engineer's report is apportioned among the municipalities benefited (the Government contributing 40 per cent., but not exceeding $4,000 per mile; and the commissioners then act as a Court of Revision to hear the appeal of any parties affected as to the engineer's apportionment of the cost. The commission may confirm or revise the engineer's

report, and unless a majority of the municipalities then petition against the work, the commission is authorized to proceed with construction.

Just as township control alone has been found too limited to provide a market road system of county magnitude, so county control very often fails to provide the united action necessary to construct and pay for roads carrying "through" traffic between important terminal points. In the absence of proper means of organization for Main Roads the rural districts bear too great a proportion of the cost of construction and maintenance. In the case of main roads subjected to through traffic, without drawing upon the cities interested, insufficient funds are available for adequate construction: repair and maintenance become expensive and neglect is apt to ensue; and to provide for connection at the border lines of adjacent municipalities, with uniformity of construction, has been impossible.

The object of the new main road legislation is to permit the cost to be levied equitably upon all communities benefited by the road. By this means also, sufficient funds become available for construction and maintenance adapted to the traffic, without unduly bearing upon any who are called upon to pay for advantages derived from the road.

XVI.

TOWNSHIP ROAD SUPERINTENDENTS.

The Ontario Highways Act provides that, where a township council employs a road superintendent to direct all road work of the township, the Province will pay one-quarter of his salary for a term of three years, the amount of the Provincial grant in any one year not to exceed $150.

This grant is payable whether or not the township has retained statute labour.

Where statute labour is retained it will be the duty of the superintendent to confer with and determine the work to be undertaken by each pathmaster, and the methods to be followed.

Townships wishing to receive the grant should especially observe the requirement of the Act that "the appointment is to be made by by-law;" that the by-law is to be transmitted to this Department within thirty days after being passed, and that it is to be of a form approved by the Minister.

The important need of township organization in this Province is that the work be put in charge of permanent and experienced men—one such superintendent in each township. A "permanent" man is necessary because experience can be obtained only by making the position a permanent one. Continuity of work under succeeding councils can be obtained only under a permanent superintendent. The value of permanence and experience are recognized in the employment of township clerks and treasurers. Much more benefit will result from the growing experience of a capable road superintendent.

Good business management applied to roads requires, as with any other business organization, that:—

1. Responsibility should be definitely centralized, and fixed in one overseer so that there is a strong incentive for him to obtain the best results and avoid mistakes.

2. The undertaking as a whole, and each detail of it should be carefully studied and planned in advance. This can only be done by making it the permanent business of one man, who can advise and guide the council from year to year.

3. Experience and skill should be brought to bear on the work. A township overseer should be kept in office just as permanently as is a clerk or treasurer, and in this way only can townships build up an efficient plan of experienced road management.

Township councils will have no more important duty than the selection of a suitable man for this position. He will be required to organize, direct and supervise the road work of the municipality; and to do this effectively, must be well qualified to lead and inspire the men employed.

In carrying out the system as outlined, it is apparent that success must largely depend on the choice of a man for overseer. That is true in any business. If an inefficient man is selected and there is a complete failure the first year, it does not mean that the new system is wrong, but merely that the council should appoint a better man. At the same time, too much must not be expected of an inexperienced man for the first year.

In placing responsibility on him for results, he must be given corresponding

Flat Top Concrete Culvert in York County.

authority, especially in the matter of hiring or discharging men and teams. The council should decide the work to be done, but the doing of the work should be in his hands.

A good overseer can, as time goes on, make a complete study of the local road situation, the relative importance of the various roads, the grading, drainage, and bridging required on each, and the location of gravel or stone. With this knowledge he can be a most valuable guide to succeeding councils just as the township clerk is in other matters.

One superintendent only is necessary rather than two or four, as is now the case in some townships. When several overseers are appointed, there is not enough work to keep them all constantly employed. The result is that they use the position of road overseer merely to fill in the time of farming or other occupation. They do their work on the roads, not at the most suitable time for the roads; but at the most suitable time for the farm. Grading, which should

be carried out in the spring, is put off until the ground is dry and hard in midsummer, when it cannot be as well or as cheaply done. Concrete culverts are neglected until frost and rain commence in the autumn.

The work for the year should be decided upon as far as possible before spring opens. The overseer can then commence grading early in the season, before the ground is hard and baked. In July, August and early fall, when streams are low, he can put in small bridges and culverts.

He could arrange to have all earth roads kept in repair by use of the log-drag. Gravelled or stone roads could be repaired when they need it. The gravelling or stoning of roads could be looked after at the best season of the year, or when teams are available. If field stone is used, it could be hauled and piled in the winter when farmers would be glad to get the work. These are details which will depend on the local conditions in each township, and should be adjusted accordingly.

Under ordinary circumstances, every road in the township would receive its proper attention, either by dragging, grading, draining or metalling. The log-drag in particular can be of enormous benefit, if its use is systematically arranged.

It is desirable that township councils wishing to obtain the benefit of this provision of the Ontario Highways Act should communicate with the Department.

XVII.

AYLMER MODEL ROAD.

A model street and road was, by arrangement with the Town of Aylmer and the Township of Malahide, constructed on Talbot Street, one of the leading entrances to the Town of Aylmer, and a part of one of the most important roads of the Province, being on a main highway between Windsor and Niagara Falls. This road has a considerable amount of through motor traffic, to which is added motor traffic between St. Thomas and Aylmer, together with local driving and teaming from the surrounding farm district. A canning factory and a milk factory cause heavy and constant teaming at seasons of the year when roads are most subject to wear. A traffic census for twelve hours, seven a.m. to seven p.m. June 9th-22nd (before improvement) showed an average daily traffic of 180 vehicles. A similar census (after improvement) showed an average daily traffic of 320 vehicles, an increase of 78 per cent.

Concrete Roadway.

The concrete pavement was laid in accordance with the general specifications for concrete roadways as contained in the report of this Department for 1913, including the use of hydrated lime in the greater part of the work. To meet the wishes of the town council, the work was commenced in October of 1912, but owing to heavy rains, the occurrence of frost, and uncertainty as to the quality of cement being received, the work was discontinued after only a short section had been laid. The surface of this section is the least satisfactory portion of the work, and is indicative of the necessity of favourable weather conditions when laying this type of roadway.

Local gravel supplies were not considered satisfactory, as samples from available pits were not clean, and there were no facilities for washing. In consequence,

river gravel was employed, dredged from the River St. Clair at the outlet of Lake Huron and shipped by rail from Sarnia. The general organization was similar to that of the Sarnia road, and described in the Report of this Department for 1914.

The concrete section is 1,918½ feet in length, 30 feet wide between curbs and 7 inches in thickness. Steel reinforcement was used throughout with transverse expansion joints 30 feet apart, and longitudinal expansion joints next the curbs. The grading, underdrainage, and construction of curbs were carried out by the Town of Aylmer. The mixture consists of one part of cement (of which 10 per cent. by weight is hydrated lime) to four parts of washed lake gravel, laid in one course.

The unit costs per square yard of pavement were as follows:—

Preparation of sub-grade	$0.016
Mixing hydrated lime with Portland cement	0.051
Hydrated lime	0.031
Cement	0.545
Gravel	0.635
Labour on concrete (including reinforcement)	0.222
Formwork and finishing	0.020
Sanding and watering (curing)	0.018
Expansion joints (tarring)	0.022
Supervision	0.073
Miscellaneous	0.033
Cost per square yard	$1.669

Macadam Roadway.

The macadam section is 4,137 feet in length, and was carried out in accordance with the general specifications of this office as contained in the Annual Report for 1911. As constructed, the road is 27 feet between ditches with stone in the centre 18 feet in width, and a consolidated depth of 6 inches at the sides and 10 inches at the centre. These widths provide for "double-track" traffic, the width of stone (18 feet) being twice that commonly provided for ordinary county road traffic.

Limestone from Hagersville was used throughout this section. A tile drain varying in size from 6 inches to 10 inches diameter was laid almost the entire length of road on the south side and for part of the length on the north side; the section within the town limits being tiled on both sides. Concrete pipe 12 inches in diameter were placed in the ditches at the various farm entrances. Catch basins were placed at convenient points along the road and connected to the tile drain.

Unit costs per square yard of stone surface are as follows:—

Stone (2,902 cubic yards 2 inch stone; 701 cubic yards screenings)	$0.519
Grading, labour, teams, etc.	0.067
Ditching, labour, teams, etc.	0.044
Unloading, teaming and spreading stone	0.326
Rolling and sprinkling	0.048
Coal	0.011

Tile underdrainage, 6 in., 8 in., and 10 in. diameter	0.104
Supervision	0.068
Tools and sundries	0.010
Cost per square yard	$1.197

Wages paid were as follows:—

Labourers	$2.00 per day.
Teams	4.50 per day.
Engineer on roller	3.50 per day.

The following data with respect to this work is of service for estimating purposes:—

Stone from Hagersville—$1.26 per cubic yard at Aylmer.

Man unloading cars—15 cubic yards per day of 10 hours, 13.3c. per cubic yard.

Haulage—1¼ mile haul—9 trips daily—loads 1½ cubic yards, 33c. per cubic yard. or $0.264 per yard-mile.

Spreading—40 to 45 cubic yards per man per day, 4.7c. per cubic yard.

Rolling—260 square yards or 52 cubic yards per day; 2c. per square yard, 10c. per cubic yard.

Rolling, coal—400 lbs. per day, $1.50; engineer, $3.50 per day; oil, 20c. per day.

Sprinkling—18 gallons per square yard or 81 gallons per cubic yard.

XVIII.

TORONTO-HAMILTON HIGHWAY.

The most important work of highway construction which has yet been undertaken in the Province under recent legislation is the building of the Toronto-Hamilton highway. The urgency of this improvement was recognized by the report of the Highway Commission in 1914, and following that report, a survey of the several alternative routes was at once authorized by the Government and completed by this Department.

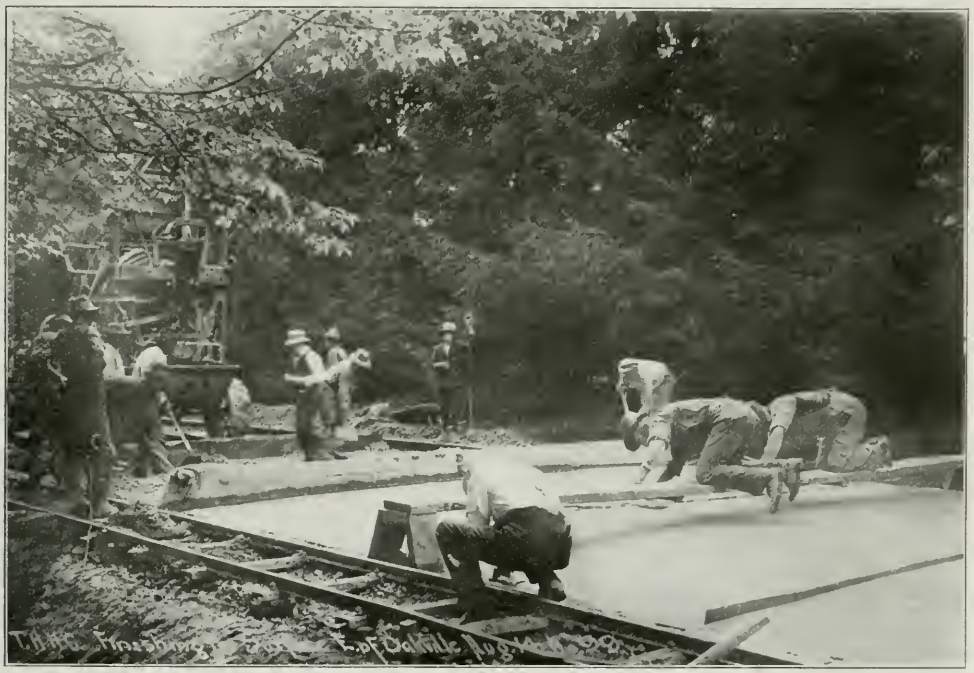
The need of a good highway between these two cities, Toronto with a population of 500,000 and Hamilton with a population of 100,000, has been felt for many years, a need which has been greatly accentuated by the growth of motor traffic. The road will serve important commercial interests of the two cities, much farm and residential traffic of the locality through which it passes, as well as tourist traffic of all kinds, including foreign automobiles entering Canada at Niagara Falls with Toronto as an objective point.

The route traversed passes largely through a fruit-growing district which, with the construction of the road, will be able to forward produce cheaply and quickly to Toronto and Hamilton by motor truck. Shipments between the two cities will be greatly facilitated, will decrease the cost of handling goods, and lessen the time required for filling orders.

At the present time when a merchant or manufacturer in one city orders goods or machinery in the other, the article has first to be handled from the warehouse to a truck, is carted to the railway terminal, is handled from the truck to the

platform and from the platform to the car; and may then reach the other city in from three days to three weeks; when the process of terminal handling has to be repeated before it reaches the purchaser.

By means of a durable pavement between these two cities, goods ordered in one city may be placed on a motor truck and in four or five hours will reach the purchaser in the other city with a minimum of handling. The advantages of this highway between the two cities, in replacing the present comparatively slow freight and express process, are thus apparent and a considerable traffic between the two cities (a distance of 40 miles from centre to centre) may be expected to develop. This section of highway is a portion of the main route which passes directly through Ontario from Ottawa and Montreal to Windsor and Sarnia, serving the oldest and most populous districts of the Province, and from that cause has much added importance.



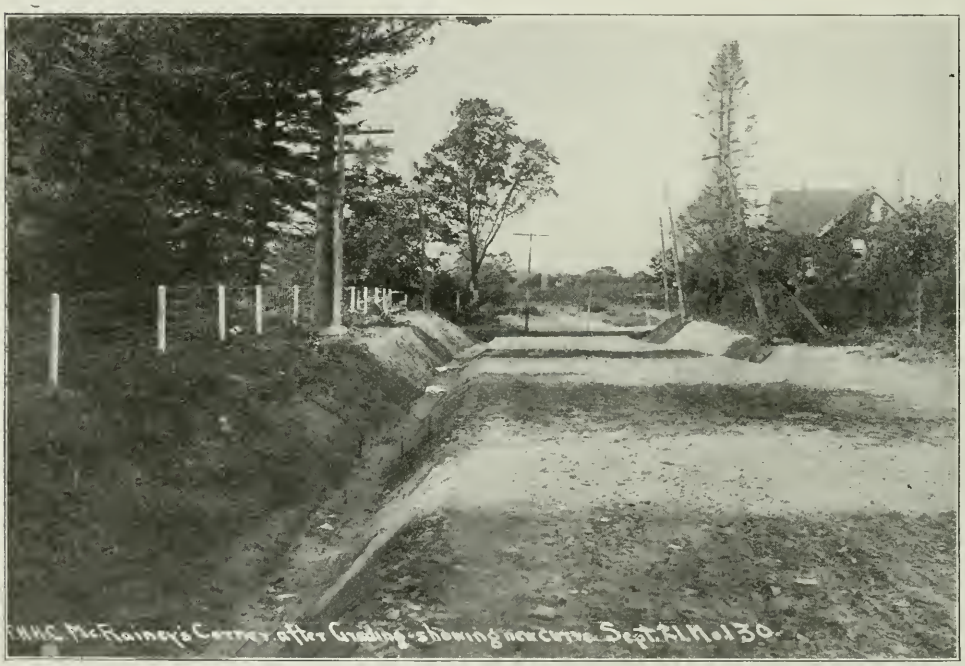
On the Toronto-Hamilton Road.

The concrete mixer, method of finishing, and industrial railway are prominent in this illustration.

Other roads between these two cities, Dundas Street, and what is known as the "Middle Road," will no doubt be improved in the future: and if macadamized only, it is important that destructive motor traffic should as far as possible be kept from them. The Lake Shore Road was selected for paving rather than the other routes for several reasons. Dundas Street has numerous hills which would be very objectionable for motor truck traffic, and it is the longest of the three routes. The Lake Shore road as contrasted with the Middle Road has a large residential population which will produce locally a considerable amount of automobile traffic between the two cities, is in a district of small fruit farms, while

it is also the more attractive route for through tourist traffic. It is thus apparent that the Lake Shore route will itself create, and will attract, the greatest amount of motor traffic of all kinds. It will, when paved, preserve the Middle Road from a large amount of injury which the Middle Road, if paved, would not prevent on the Lake Shore Road. Other minor reasons indicate the Lake Shore Road as the most desirable one for immediate improvement with a durable pavement.

Upon the outbreak of war in August, 1914, it became apparent that a considerable amount of unemployment would result during the ensuing winter, to cope with which steps to create employment became desirable. To this end a group of private citizens offered to co-operate with the Government in financing this important project, agreeing to provide the necessary funds for a period of five



On the Toronto-Hamilton Road.

At the point shown in this illustration, the road is curved to avoid two sharp turns on the old allowance, and the grading and draining are typical.

years before calling upon the Province and municipalities interested for any part of the capital outlay. An agreement was entered into and a Commission was appointed by the Government to take charge of the work, composed of George H. Gooderham, M.P.P., Chairman, G. Frank Beer, Esq., Toronto, W. S. Davis, Esq., Oakville, Maxwell C. Smith, Esq., Burlington, R. Lush, Esq., Clarkson, and Hugh Bertram, Esq., Vinemount. Mr. H. S. Van Scoyoc was appointed by the Commission as their Chief Engineer.

The organization for this work has been defined by a special Act, chapter 18, Statutes of Ontario, 1915, under which the provision for the cost is made up as follows:—

Provincial contribution	$4,000 per mile.
City of Toronto	150,000
City of Hamilton	30,000
Townships and villages en route	4,000 per mile.
Property benefited	the balance of cost.

It is the decision of the Commission to construct this road of concrete, the paved portion to be 18 feet in width, 8¼ inches in thickness in the centre and 6 inches in thickness at the sides. The concrete pavement will be placed in the centre of the road allowance and will have shoulders on each side 3 feet in width. The maximum permissible grade has been fixed at 4 per cent. The amount of earthwork needed to meet these requirements has been moderate except between Port Credit and Oakville, where a series of hills occurs, more especially in the vicinity of Clarkson.

Road construction as a means of giving employment during the period of depression is not so effective as it was prior to the use of labour saving machinery. The employment of stone crushers, concrete mixers and industrial railway for haulage, have undoubtedly reduced the amount of manual labour required, but the use of such machinery is a necessity if reasonable economy is to be attained. While the amount of manual labour employed on the road is thus reduced, a large amount of work is nevertheless created (but which is not so apparent) in stone quarries, sand pits, cement factories, for railway haulage and in minor trades. The benefit of a work of the magnitude of the Toronto-Hamilton highway is therefore more effective than is evident on the road only. The construction of the Toronto-Hamilton highway was thus a work of exceptional advantage because of the large population served, and because of the considerable amount of employment created during a period of depression.

XIX.

PERMANENT BRIDGES AND CULVERTS.

Municipalities and road authorities of the Province have for some years followed the very laudable policy of building only steel and concrete bridges—concrete for short spans and steel for the larger structures. The use of wooden culverts and bridges has been discontinued for a considerable term of years and the Province has been passing through a period in which, by the decay of timber bridges and culverts, an especially large outlay has been demanded to replace them with the more durable but more expensive materials.

This work, especially in municipalities where there are large bridges or where small water-courses are numerous, has entailed a considerable expenditure. In the majority of cases, the bridges have been paid for by direct levy in the year in which they were built, and, as a result of this comparatively heavy expenditure from time to time, an adequate outlay for road construction has been prevented.

In a number of municipalities this work is now approaching completion, and the tendency is to devote to road improvement the money which has heretofore been spent in bridge and culvert construction.

The policy of paying for these durable structures, where they are few in number, by annual levy is one which cannot be criticized, where the total outlay required is not great. In cases, however, where the total expenditure will be con-

siderable and where the "pay-as-you-go" system will withhold expenditure on road construction for a considerable period, the method may very properly be called in question. Steel and concrete bridges are of a permanent character and should be of use, if properly constructed, for several generations. It is, therefore, proper that the future should be called upon to pay some portion of the cost; particularly if by the policy of immediate payment the present generation is compelled to forego the advantage of good roads.

Good roads are necessary to the development of every locality, and delayed development in each locality delays the proper development of the Province as a whole. It would be to the advantage of many municipalities if a complete enumeration of all culverts and bridges were made, plans and estimates considered, and means of financing the work provided, in order that it could be carried out without obstructing important road improvement, which should proceed concurrently with bridge construction.

The construction of strong and durable bridges throughout the country is undoubtedly a wise measure. It appeals to the good judgment of the ratepayers of the Province because they have been educated to this policy as a matter of necessity. Similar experience with good roads very quickly informs the ratepayers as to the much greater advantage of bridging miles of clay and earth roads with a substantial surface of gravel or stone.

XX.

BRIDGE PLANS.

County bridges under the Municipal Act are required to be constructed under specifications approved by this Department. This applies to all counties, not merely to those operating under the Highway Improvement Act.

In pursuance of the statute in that regard standard specifications for steel and concrete bridges have been issued by this office, and municipalities have the privilege of sending to this office plans of proposed bridges to be checked by our engineering staff.

This Act relating to bridges has been productive of much good; not only counties, but townships and other municipalities take advantage of its provisions. Of all plans submitted, a large proportion have required amendment. In the case of steel bridges the tendency has been to make the parts too light, while in many instances there has been faulty design in connections and other particulars. Concrete bridges for shorter spans are more frequently deficient in depth of beam and in the amount and placing of beam reinforcement.

There has been a tendency also for municipalities to accept bridges, on the score of economy, which are too narrow. On all main highways subjected to much motor traffic, space should be provided for two lines of traffic. This, for safety, requires a clear width of 20 feet—a width which should be elsewhere accepted for short span structures. For long steel spans, a clear width of 18 feet may be accepted, while comparatively light traffic may be accommodated on a width of 16 feet. It is to be remembered in erecting these structures that, with care, they will last for a considerable period, and not only should present travel be considered, but also traffic of the future. To this end heavier and wider bridges are desirable, if the present expenditure now being made on these structures is to perform a maximum of usefulness.

The construction of narrow steel and concrete bridges at the present time means also that the abutments and piers upon which they rest are proportionately narrow, and that when future necessity of widening arises much of the present outlay may be thrown away.

Concrete Arch with Suspended Floor in Halton County.
Greater head-room is possible by means of this form of construction.

XXI.

ROAD DEVELOPMENT.

The present condition of the roads of the Province has on the whole been reached by a process of gradual development. Hills have been cut from time to time and gradually reduced, the low places being proportionately filled. Drainage has been gradually improved. Permanent bridges and culverts have been gradually constructed. The mileage of partially surfaced and gravelled roads throughout the Province is very considerable and is creditable to the municipal organization of the Province.

The question of main highways is one which is steadily assuming greater importance, and the need of making provision for a growing volume of traffic is becoming more urgent.

Three general methods suggest themselves of dealing with the more important main roads upon which the amount of traffic is likely to increase for a considerable period.

(1) Construction of a complete and comprehensive kind may at once be undertaken adequate to the needs of all traffic for a considerable term of years.

(2) A durable road may be at once constructed sufficiently wide for traffic to be anticipated in the near future, but making provision for widening and improving the surface as traffic may increase. Under such a plan it may be practicable for immediate needs to construct a Macadam or Telford road with stone ten or twelve feet wide and gravel shoulders, this to be maintained for a term of years by bituminous treatment. Later the foundation can be widened, and a surface applied suitable to the heavier traffic that may have developed.

(3) A slower process may be followed whereby steps are first taken to complete bridges and culverts in an adequate and substantial manner; to cut the hills, fill low spots and reduce grades to a point where they may remain permanently; to grade the road throughout, providing ample ditches with adequate outlets so that there will be a permanent earth subgrade for any surface that may be applied in the future. For temporary needs, the road may be maintained with a light gravel or broken stone surface. By such a process there may be brought about a gradual development with restricted present expenditure and at a minimum cost until the period is reached when increased traffic demands a substantial and durable surface.

The policy selected should be largely moulded by existing and probable traffic

FINISHING A CONCRETE ROAD.
Workman on bridge using a divided float in making an even joint.

and available finance. Each of the foregoing methods has advantages which may be most acceptable for varying sets of circumstances.

XXII.

TOWNSHIP AND COUNTY ROAD MAPS.

A series of township and county road maps has been undertaken by this office; the township maps on a scale of one-half mile to the inch, and county maps on a scale of one mile to the inch. The need of these has been greatly felt in connection with road surveys and inspections, as they are necessarily the basis upon which Provincial work must be initiated.

Maps heretofore available have been inferior, incorrect, and not on a scale adapted to the work of the office in compiling information and for record pur-

poses. The very general absence of maps for municipal purposes is also a serious deficiency, and those now in preparation will, in that regard, fill an important need. Information is being obtained from all available sources. The township and county maps, when corrected and completed, will form the basis of an accurate road map of the Province, for which there is a growing demand.

Good maps of the townships and counties of the Province, showing the location of all roads, are essential to systematic road development, whether from a local or Provincial standpoint. Maps are necessary to a clear understanding of traffic requirements, and local topographical conditions, and for purposes of record.

Every township council should have maps of their municipality showing the location of roads, and their condition, bridges and culverts, drainage areas, road

FINISHING A CONCRETE ROAD.

Workman on bridge, using a wooden float.

materials, areas of waste, wooded and uncultivated lands, marked variation of soil, population (residences), villages, local markets, industries and shipping points, schools and school sections, and other features with which, as a municipal council, they have to deal.

The road superintendent of the township or county should have all these facts before him on a map to assist in deciding the problems of road improvement that from time to time present themselves. He should record on these maps the nature and progress of his work. All bridges and culverts should be numbered, and memoranda kept regarding them so that information as to their condition and dimensions will be available at all times.

XXIII.

TESTING ROAD MATERIALS.

The testing and investigation of road materials is a field in which much useful work can be done for the Province; and with the development of road construction, its value will continuously increase. Through co-operation with the authorities of the University of Toronto, the testing laboratories of the Faculty of Applied Science have been available for the use of the office in the testing of road materials, the work being carried on by an engineer of this office.

A general rule with respect to broken stone and gravel in common road construction is that the material of the locality must be used irrespective of quality, as the cost of importing better stone or gravel by rail would be prohibitive. As a rule it is found practicable to use a softer grade of stone more freely and frequently rather than to meet the additional cost of freight rates on a more durable stone from a distance. Nevertheless, there are frequent occasions when choice may be made between two or more grades of stone or gravel, and information as to relative wearing qualities becomes important.

The growing use of concrete for road construction has necessitated a careful selection of materials. A proper quality of sand is as necessary as a sound grade of Portland cement. The wearing strength of the roadway is largely dependent on the broken stone or gravel. The addition of other materials such as hydrated lime is also a matter for careful study with a view to an improved consistency of concrete for road purposes. All of these are matters which can be determined by laboratory investigation only, and are beyond the means of rural municipal authorities.

A knowledge of the relative quality of materials may lead to the rejection of inferior grades; or it may also lead to more suitable methods of employing available materials.

A report on road material tests conducted by this Office will be found as Appendix B of this Report. Local municipalities desiring to submit samples of stone, gravel and sand for proposed road construction, may have them tested without charge, and instruction as to samples will be sent on request.

XXIV.

ROAD SURVEYS.

Preliminary road surveys were undertaken in 1914 in accordance with the recommendations of the Highway Commission, in order that this office might have a full record of road conditions throughout the Province. The information will have much value in various ways. An immediate object, however, has been to study the situation in each of those counties which have not yet established systems of county roads, with a view to placing before the county councils definite suggestions in that regard.

The work was rapidly carried on by an engineer and an assistant, using an automobile for conveyance. Following a general consideration of each county in relation to local markets and shipping points, and the distribution of rural population, the more important roads in relation to farm traffic were examined; progress being made at the rate of about twenty-five miles in a day. Field notes of each road examined included the following:—

Local name of the road.
Location, lot, concession and distance covered by notes.
Population on road, and nature of farm products.
Population to be served by road, other than residents on the road.
Industries located on road—brick plants, quarries, sand pits, etc.
Class of vehicles using roads.
Alignment of allowance and roadbed, and change of location desirable to improve alignment or for more favorable construction.
Material on surface.
Sub-soil.
Existing cross-section—sketch from fence to fence.
Grades and hills, and desirable changes of location to avoid steep hills.
Drainage existing.
Bridges and culverts, their condition and location.
Electric railways on the road, and their location.
Recent work.
Local material available for their section.
Improvement desirable.

The counties covered by this survey were Essex, Kent, Elgin, Grey, Dundas, Stormont and Glengarry, Prescott and Russell, Victoria, Ontario, and portions of Bruce and Durham. Owing to uncertainties created by the war, the work was discontinued in September, 1914, and was not resumed in 1915. Omitting the counties now operating under the Highway Improvement Act, and in which such surveys are not immediately necessary, the remainder of the Province can be quickly covered to meet immediate requirements in connection with proposed county systems.

XXV.

CONFERENCE OF COUNTY ROAD SUPERINTENDENTS.

A conference on highway construction for County Road Superintendents and Engineers was arranged by this Department and held at the Parliament Buildings, Toronto, in February, 1915. The meeting was well attended and met with marked success: and it was, therefore, decided to continue the course of lectures annually.

The series of lectures arranged for this conference was undertaken more especially as a means of giving departmental instruction to County Engineers and Superintendents, who are in charge of roads subsidized by the Provincial Government under the Highway Improvement Act. An invitation, however, was extended to all municipal engineers and others interested in road construction who might desire to attend. Municipalities were invited to send their Road or Street Superintendents should they so desire.

In an organization covering the southern portion of the Province of Ontario, uniformity of methods and personal touch between the engineers of the Department and the County Superintendents are essential for the efficient carrying on of highway improvement. No more successful means of attaining this has been found than by these conferences, held shortly before the construction season has commenced.

County officials necessarily come to the Department from time to time for the purpose of consultation, or are assisted in their work by engineers of the Department. It is felt that to bring them together at one time for the purpose of an intimate talk on practical methods will serve a number of useful purposes; that

it will give a considerable amount of direct instruction to county road officials; that it will lead to greater uniformity of work throughout the Province; that it will tend to a clearer understanding of the requirements of the Department; that it will lead to an exchange of experience among the various county engineers: that it will bring the county officials into acquaintance with one another, and will lead them to inspect work completed or in progress outside of their own counties; and that a broader understanding of the work will result.

Lectures are made thoroughly practical in all particulars, with special reference to local requirements of county road construction. A limited amount of time was necessarily given to the broader features of the situation in order that each subject as a whole might be outlined.

The subjects of lectures and discussions were as follows:—

Types of road for the open country.
Road location and grading.

Industrial Railway for Road Construction.

The large amount of material required for the Toronto-Hamilton Highway has been moved from the railway siding to the road in dump-cars drawn by small steam engines on a portable track of light steel rails.

Alignment, straightening, hills, sub-base, etc.
Drainage of roads.
Geology of road materials.
Care of the roadside.
Departmental regulations.
Gravel roads.
Stone roads.
Concrete roads.
Bituminous and brick roads.
Culverts.
Bridges and abutments.
Maintenance and repair of roads.

Machinery and operation.
Quarrying and explosives.
Cost-keeping, road accounts and reports.
Traffic and modern road construction.
Dust-laying.
Cost estimates.

XXVI.

ROAD OILS.

Road oils used in Ontario are of two distinct varieties—asphaltic and non-asphaltic. The crude oils native to the Province (Essex, Kent, and Lambton) are non-asphaltic, the place of the asphalt being taken by a paraffin base. It has been

Macadamized Street in Westport, County of Leeds and Grenville.

fully recognized that asphaltic oils are superior to paraffin oils for dust prevention; the asphalt acting as a binder and having a more permanent value in the road surface; whereas paraffin in excess is objectionable in its effect on the road surface.

Asphaltic oils contain asphalt in varying degree, those commonly in use containing from 40 per cent. to 80 per cent. of asphalt. Up to 40 per cent. the oils can be applied cold to the road. Above 40 per cent., however, it is necessary to heat the oil to permit it to flow.

An early tendency in the use of asphaltic oils for dust prevention was to seek a carpet coat of ⅓ or ½ inch in thickness, made up of successive layers of oil and stone chips or gravel. It was believed that a heavy bituminous covering might thus be cheaply built up. This process has been found impracticable, however, as a thick covering has a tendency to roll, forming a wavy, uneven road surface. Practice now tends to the use of such a grade of asphaltic oil as will produce a thin, tough film of asphaltic coating rather than the thicker coat of bitumen and gravel.

Asphaltic oils for dust prevention have been found exceedingly serviceable and sanitary. Dust is continuously prevented for long periods by their use; whereas ordinary water sprinkling is of very temporary benefit with intervening dusty periods which it is impossible to prevent. Light asphaltic oils are applied to the surface of a macadam or gravel roadway by the use of an ordinary sprinkling wagon. If the heavier grades of oil are used, however, it is necessary to provide means of heating the oil; and it is also desirable to apply it under pressure, for which process special wagons are now manufactured.

The effective use of asphaltic oils on broken stone or gravel surfaces requires that, before application, the road should be thoroughly cleaned and made free from all mud and dust, in order that the oil and asphalt may adhere directly to the clean surface of the road. To apply asphaltic oil to a dirty and unclean road surface is a wasteful and inefficient way of using this material.

Owing to complaints which have from time to time reached the office respecting the use of road oils, more especially non-asphaltic oils with paraffin base, samples were submitted to chemical examination. A report in the matter is hereto attached, being Appendix C.

XXVII.

TRAFFIC CENSUS.

A census of traffic was taken in 1914 on a number of roads throughout the Province, more especially those carrying through traffic and on roads adjacent to cities. The count was made between the hours of 7 a.m. and 7 p.m. in each case, and for a period of one week, principally during the latter part of July or the early part of August. In all 210 stations were covered on 133 roads.

No previous data of the kind has been available in the Province, and its absence has been much felt in considering various problems of road improvement. Among the advantages of the census are the following:—

(1) It will serve as a basis for defining suburban roads under the Ontario Highways Act; the roads to the construction and maintenance of which cities should contribute. The distance which the suburban influence extends from the city boundary will be largely indicated by the amount of traffic in excess of ordinary rural conditions. The results of the traffic census should therefore aid suburban road commissions in making equitable adjustment between the counties and cities affected.

(2) Information as to the traffic now carried by certain roads will indicate the degree of traffic which can be satisfactorily served by certain road materials and methods of construction now in use.

(3) While the construction or improvement of a road necessarily tends to increase the traffic over it, nevertheless the existing traffic on certain of the present main routes is to some extent an index of the probable future increase of traffic for which provision must necessarily be made.

(4) Data as to traffic before improvement, followed by a census of traffic following improvement, will form a valuable record upon which to base future estimates.

(5) Definite knowledge of the traffic served is a basis upon which to estimate the economic advantage of road improvement and in determining the public expenditure which can profitably be made thereon.

The complete result of this traffic census, with maps showing the location of stations, will be found in Appendix D.

XXVIII.

TRAFFIC AND ROAD CONSTRUCTION.

Traffic, present and potential, is the chief factor in determining the class of surface to be used and the amount of expenditure permissible on any given road.

The wear of a road is largely proportional to the number and kind of vehicles using the road. For very light traffic, a correspondingly light type of construction should be chosen. But for heavy traffic, a stronger form of road should be built. For light traffic, an earth road or single track gravel road may be satisfactory: but as traffic increases, broken stone roads, double tracked, and heavy foundations are required. Or, leaving the commoner forms of road, as traffic increases in density,

FERRY ON THE NATION RIVER, EASTERN ONTARIO.

A primitive type of crossing, few of which remain in the Province.

we proceed to concrete pavements, bituminous treatments, wood, brick and stone blocks and concrete bases.

It is apparent that not first cost alone is to be considered, but cost of maintenance as well; and that the most favourable union of these two items in a term of years is the proper viewpoint from which to decide the economy of a road or pavement. Proceeding further, we may properly divide the annual cost by the number of vehicles using the road, so as to determine the cost per vehicle per mile. This we may consider as a toll charge, and on this basis determine the relative economy of various types of road. For example, the mileage costs of a road drained, graded and gravelled for a traffic of ten vehicles per day at a cost of $1,500 per mile might be estimated as follows:—

Depreciation, 8%	$120.00
Repairs, $3 per vehicle	30.00
Total per annum	$150.00

Cost per day ..... (about) 41 cents.
Cost per vehicle per mile..... ....(about) $4\frac{1}{10}$ cents.

The same road might very satisfactorily serve thirty vehicles a day, in which case the cost would be as follows:—

Depreciation, 8%	$120.00
Repairs, $2 per vehicle	60.00
Total per annum	$180.00

Cost per day ..... (nearly) 50 cents.
Cost per vehicle per mile ..... $1\frac{2}{3}$ cents.

A further example may be taken in the case of a road built for the heavier traffic of 600 vehicles a day at a cost of $10,000 a mile, as follows:—

Depreciation, 8%	$800.00
Repairs, $1 per vehicle	600.00
Total	$1,400 00

Cost per day ..... (nearly) $3.84.
Cost per vehicle per mile ..... $6\frac{4}{10}$ mills.

In the foregoing estimates, "Depreciation" is that charge which will resurface the road from period to period and maintain it permanently; while the charge for "Repairs" is merely the amount which will be paid for filling holes and depressions, cleaning ditches, and (in the case of heavy traffic) for oiling, tarring and maintaining a dustless surface.

Regarded in the light of toll charges, or cost per vehicle per mile to the municipality, it is evident that a road costing $10,000 a mile to build, and $600 a year to keep in repair, with $800 for maintenance, but accommodating 600 vehicles per day, provides cheaper traffic than does a road costing $1,500 to build, and $150 a year to repair and maintain, when the latter serves only ten, twenty, or thirty vehicles a day.

In the first case the cost is $6\frac{4}{10}$ mills per vehicle per mile; in the example, with ten vehicles per day, the cost is $4\frac{1}{10}$ cents per mile, and in the case of thirty vehicles, $1\frac{2}{3}$ cents per mile. Reduced in this way to toll costs, it is apparent that roads costing $10,000 per mile with proportionate traffic may be more economical than roads costing $1,500 per mile for first cost. The problem then becomes one of so distributing the initial and maintenance costs that the population benefited and territory served by the road will contribute to the expenditure.

XXIX.

TRAFFIC AND STATUTE LABOUR.

The statute labour system has had a tendency to obscure the necessity of building and maintaining roads in proportion to the traffic over them. One road is regarded as being as important as another. Under the theory commonly applied to the statute labour system, labour is somewhat uniformly distributed, and it is considered by the ratepayer that there should be equality of expenditure on all road beats; the statute labour available in any road division should be sufficient to maintain the roads; if any are not properly maintained, it is because statute labour is not properly performed; and conversely, if the roads are good, it is because statute labour has been faithfully performed under an efficient pathmaster. The factor of traffic and its influence on roads is very often overlooked or forgotten; and because statute labour has been successful in keeping up roads carrying a dozen vehicles a day, it is regarded as a vindication of the statute labour system, and an argument for its use on all roads—even those carrying 200 vehicles a day.

Statute labour, under favourable conditions and with good management, may be made a useful source of effort for road improvement, but its use should be confined to purely local roads; while roads upon which traffic converges should draw expenditure from a proportionately wide area.

XXX.

TRAFFIC CHARTS.

The accumulation of traffic approaching villages, towns, cities, local industries, and shipping points is an important factor in determining the character of road improvement necessary, and in estimating the cost of maintenance.

The traffic charts on the following pages, show how this accumulation might be expected to progress under certain assumed conditions. The conditions assumed are:—

1. Traffic is to reach a central market town from within a ten-mile radius, each farmer making an average of one trip per week.

2. Each farm consists of 100 acres, in double fronted concessions; the concession roads running east and west being 1¼ miles apart, and the side roads, north and south, 2 miles apart.

3. Certain roads, shown in heavy black lines, are substantially constructed, and all traffic moves to these from the farms by the shortest and most direct route.

These assumptions would in no case be found in actual experience. It might be more common experience to estimate that the farmers close to the market centre would go there two or three times a week; while those most distant would go only once in two or three weeks. Also there is traffic originating at and moving outward from the market centre. It is unnecessary, however, to complicate the diagram by these considerations, since the truth to be impressed can as readily be reached by the simple assumption that each farm uses the road, directly or indirectly, to the extent of one trip per week.

The figures on the diagrams indicate the total number of vehicles using the road daily. The number is the sum of the vehicles going both ways.

The traffic estimated for each of the two roads going directly into the market centre, is that for the half circle, although only the quarter circle is shown in the

chart. The number of vehicles on the improved roads therefore includes traffic from the adjacent quadrants. (Thus the figure "5" at the extreme end of the main concession road in each chart, is made up of one vehicle from the lower quadrant, one from the upper quadrant, and three from the concession road itself.)

The "vehicle mileage" is the sum of miles travelled daily by all the vehicles using the roads within the half-circle. Or it may be described as the average length of journey to and from the market centre, multiplied by the total number of vehicles using the roads daily. (It is equivalent to the number of vehicles travelling one mile daily; or to the number of miles travelled by one vehicle to perform the same total journey).

Under actual conditions, traffic would not converge in one market centre only, and would be complicated on certain roads by traffic between towns and cities, or to cheese factories, canning factories or often local industries. Nor would the roads, owing to more or less broken country, be uniformly serviceable for traffic.

Important facts illustrated by these charts, however, are the following:—

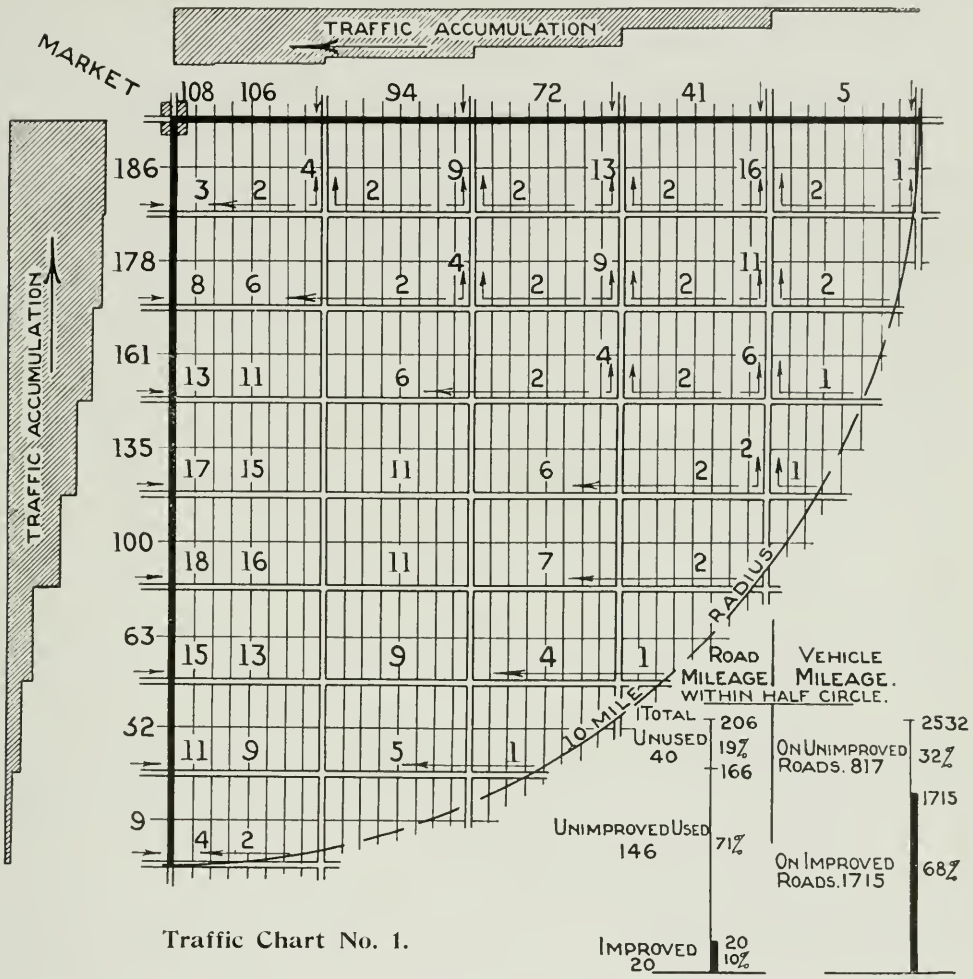
1. Traffic concentrates in a notable degree, on the roads immediately adjacent to shipping points, villages, towns and cities; which roads must have special expenditure for construction and maintenance, and therefore form the basis of a "County Road System."

2. Many roads, carrying the traffic only which originates on the abutting farms, are very lightly travelled, and can therefore be constructed and maintained at little expense.

3. Certain side roads are of very little public use, and their improvement should be delayed until roads of more general service are constructed.

4. The construction of a very limited proportion of roads, properly selected in relation to traffic, will benefit a very large proportion of the total vehicle mileage. Thus in chart No. 2 it is shown that 19 per cent. of improved roads will carry 80 per cent. of the total vehicle mileage.

5. The diagonal road has the important advantage of reducing the average length of haul to the market centre. Thus the total vehicle mileage for the rectangular systems is about 2,535 miles; whereas in chart No. 9, showing a more diagonal road, there is a total of 2,165 vehicle miles. Traffic is also more uniformly distributed by the diagonal road.



Traffic Chart No. 1.

Each chart illustrates the accumulation of traffic on roads approaching a market centre, as more fully stated on page 47.

The arrows show the direction of traffic on each road. The traffic accumulation on each improved road is graphically shown in the shaded section. The mileage diagrams in the lower right-hand corner show the relation between the mileage of improved road and the traffic carried.

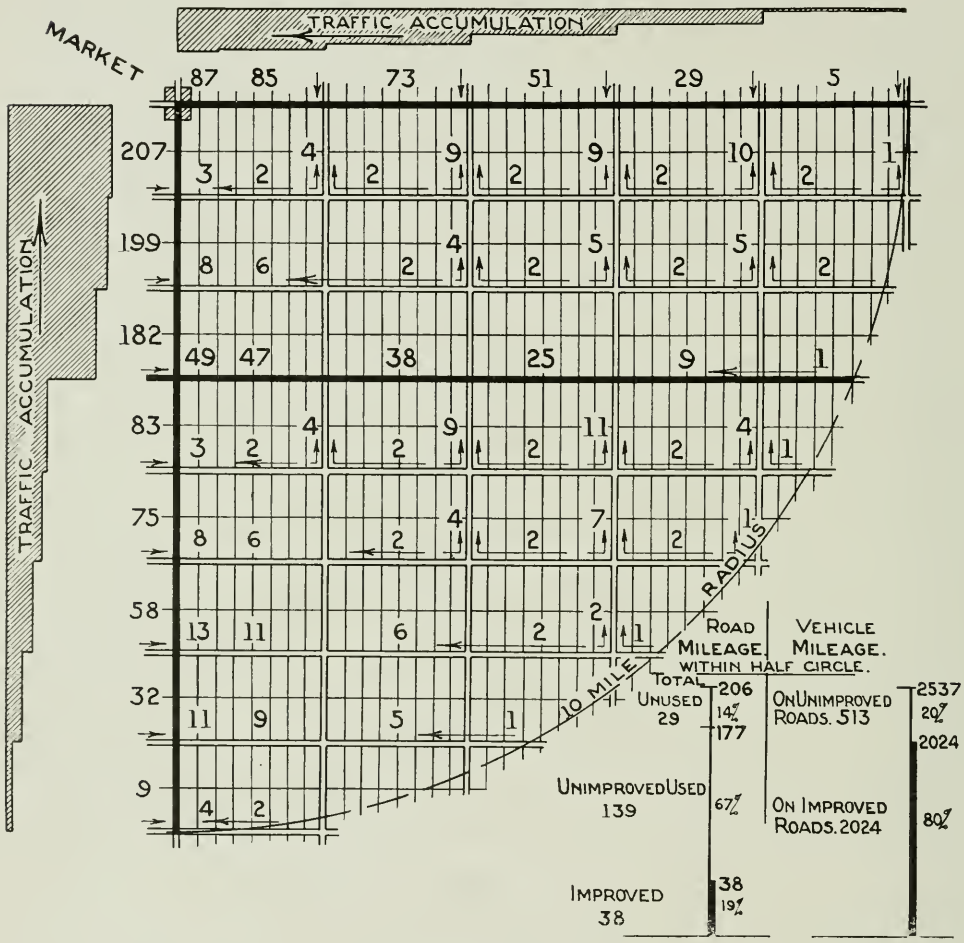
While one-quarter only of the circle is shown, the traffic considered includes that reaching the improved roads from the territory served—the half-circle.

In Chart Number 1, two roads only are improved—those radiating immediately from the market centre—the concession line east and west and the side road north and south.

The figures on the chart show the number of vehicles passing over the adjacent section of road daily. In outlying sections there is an average of only one vehicle per day. The maximum on any of the unimproved side or concession lines is eighteen vehicles; while the improved roads immediately at the market centre serve a traffic as great as 186 vehicles per day.

Since roads are worn in proportion to traffic, it becomes apparent that those radiating from market centres or shipping points should constitute the basis of a system of county roads. It shows also why roads near and within towns and villages have the reputation of being the worst roads.

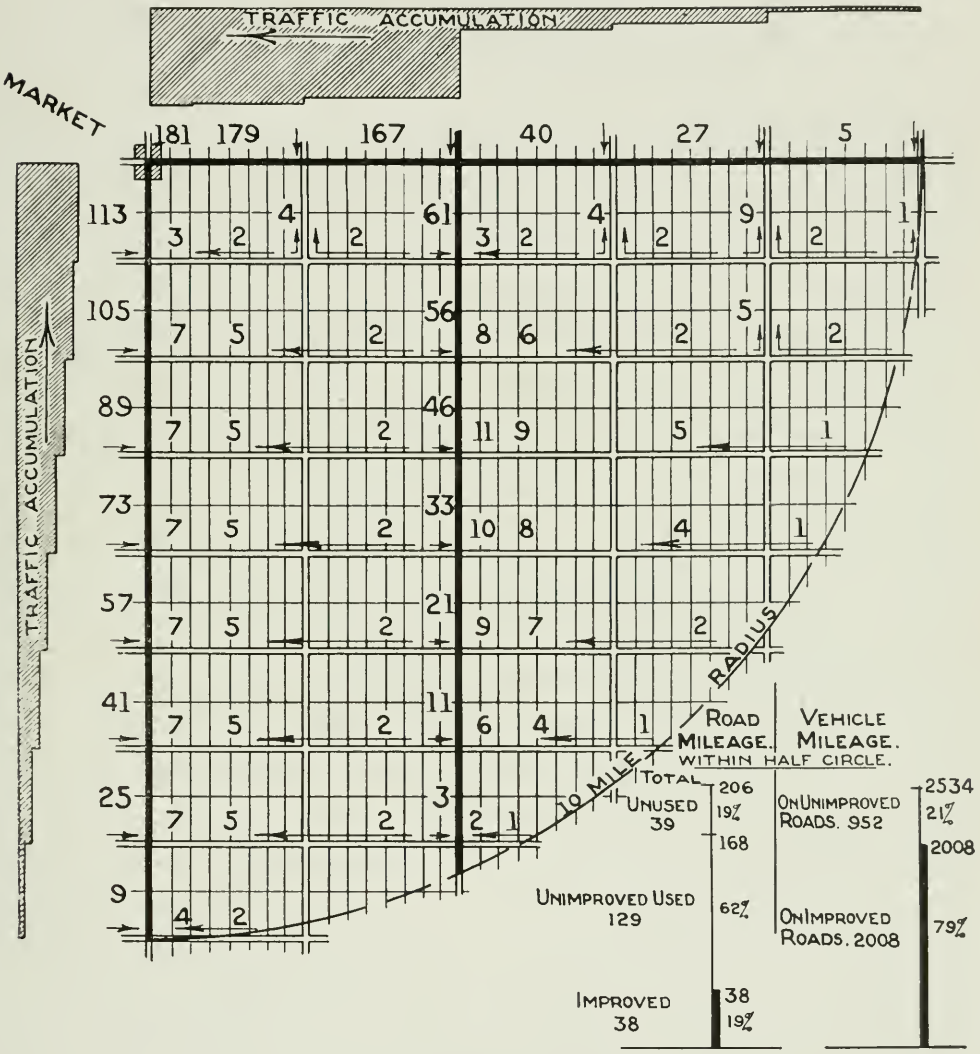
Referring to the mileage diagram in the lower right-hand corner, it will be seen that there are 206 miles of road in the semi-circle. Those improved are 20 miles in length, or less than 10% of the total. Yet of the total vehicle mileage (2,532 miles), 68% passes over the improved roads; and 19% of the roads are not used at all.



Traffic Chart No. 2.

Chart No. 2 shows an additional concession road improved. This, it will be seen, draws traffic from the main concession road and throws a disproportionate traffic on the main side road; with the result that, at the market centre, there is a maximum of 207 vehicles daily on the main side road, and 87 on the main concession road. This may or may not be of advantage, according to local conditions; but it is apparent that the main side-road, under such circumstances, would require a greater expenditure for construction and maintenance than would the main concession road.

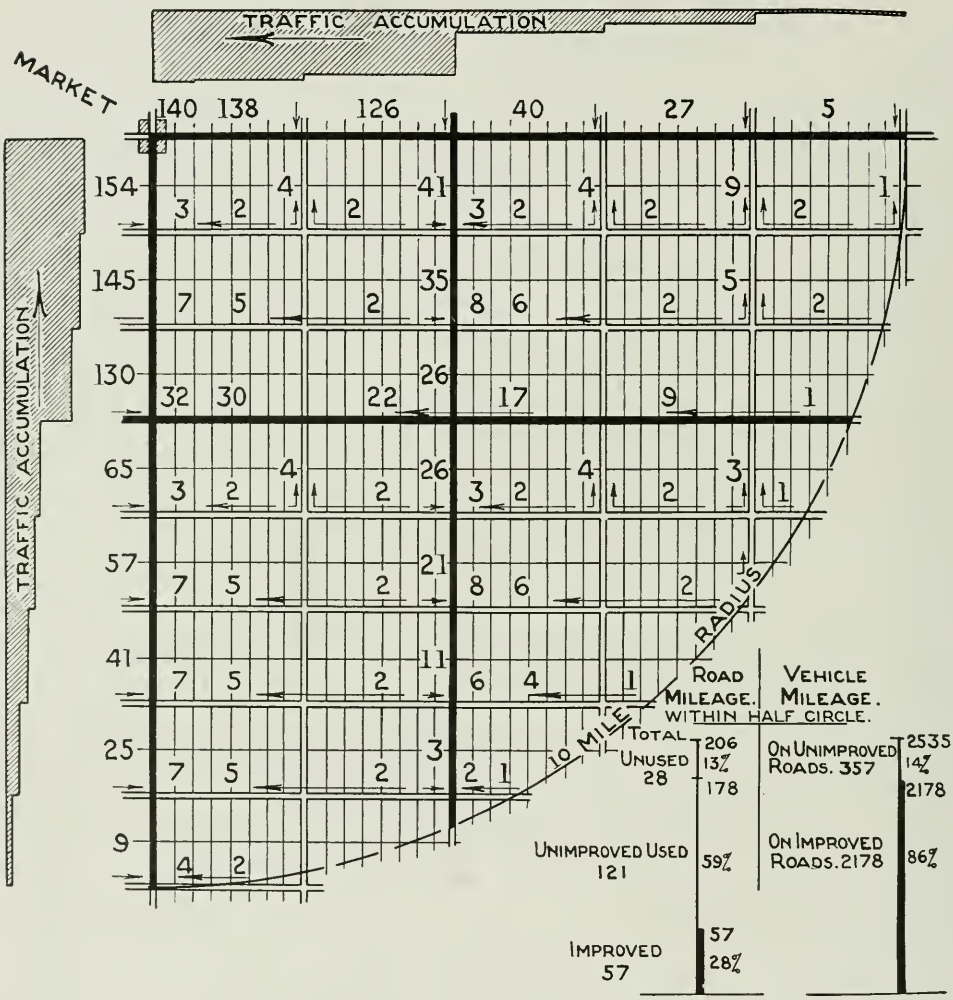
The benefit of the additional road improvement is shown in the mileage diagram, in that, by improving 19% of the roads we serve 80% of the vehicle mileage. Compared with Chart No. 1, while the length of improved roads is increased from 20 to 38 miles (nearly doubled) only 12% additional vehicle mileage is carried on the improved roads.



Traffic Chart No. 3.

Chart No. 3 shows the effect of improving an additional side-road, as compared with the additional concession road as shown in Chart No. 2. In the present case the number of vehicles carried by the two main roads is less disproportionate; while the ratio of improved roads to vehicle mileage is very nearly the same in both cases, i.e., 19% of improved roads carrying 79% of the vehicle mileage.

It is not to be understood that concession and side roads always bear these relations; but a comparison of the charts indicates the advisability of studying probable traffic tendencies in each locality, and equalizing traffic or preventing congestion as circumstances may require.

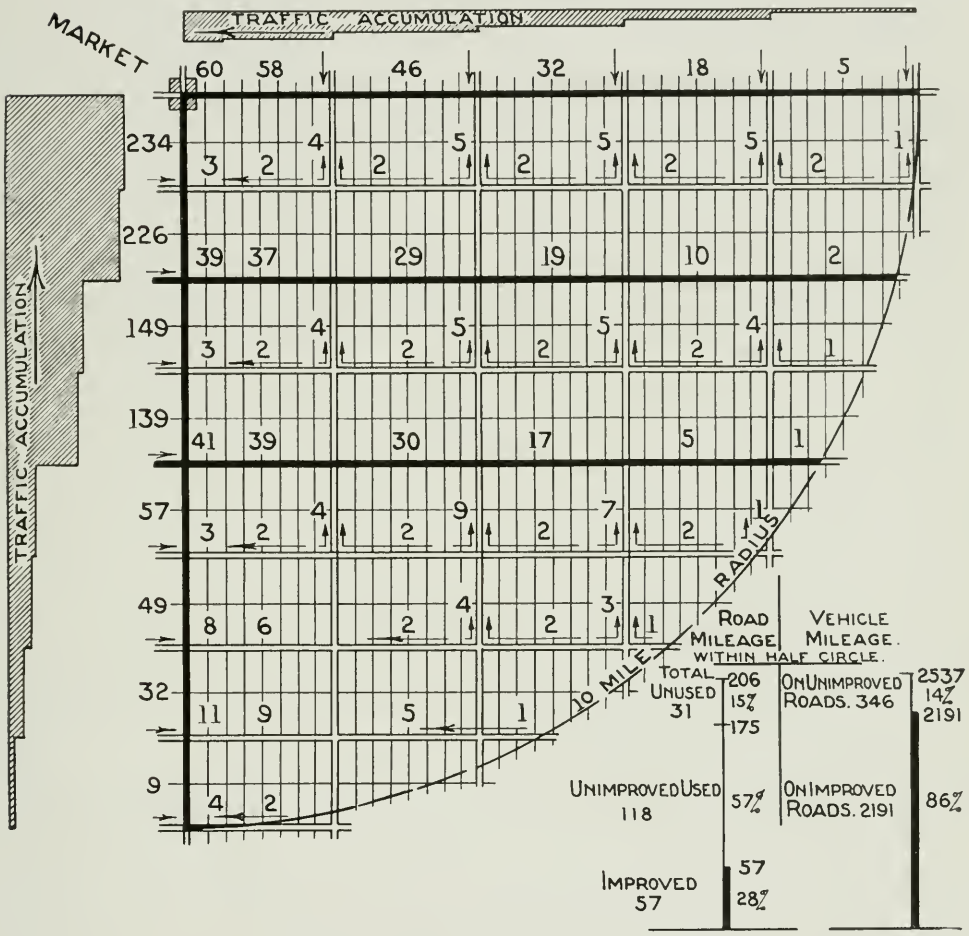


Traffic Chart No. 4.

Chart No. 4 shows the additions of Charts Nos. 2 and 3 combined, adding the secondary side and concession lines. Traffic on the main roads at the market centres is more nearly equalized.

The mileage diagram, however, shows that the roads improved constitute 28% of the total, and carry 86% of the vehicle mileage. Compared with Chart No. 1, it will be seen that, while the improved roads have been increased by 18% of the total, the vehicle mileage carried by them has increased only an additional 19%.

The number of vehicles on each section suggest the greater proportional economy of improving the additional roads to their point of intersection.

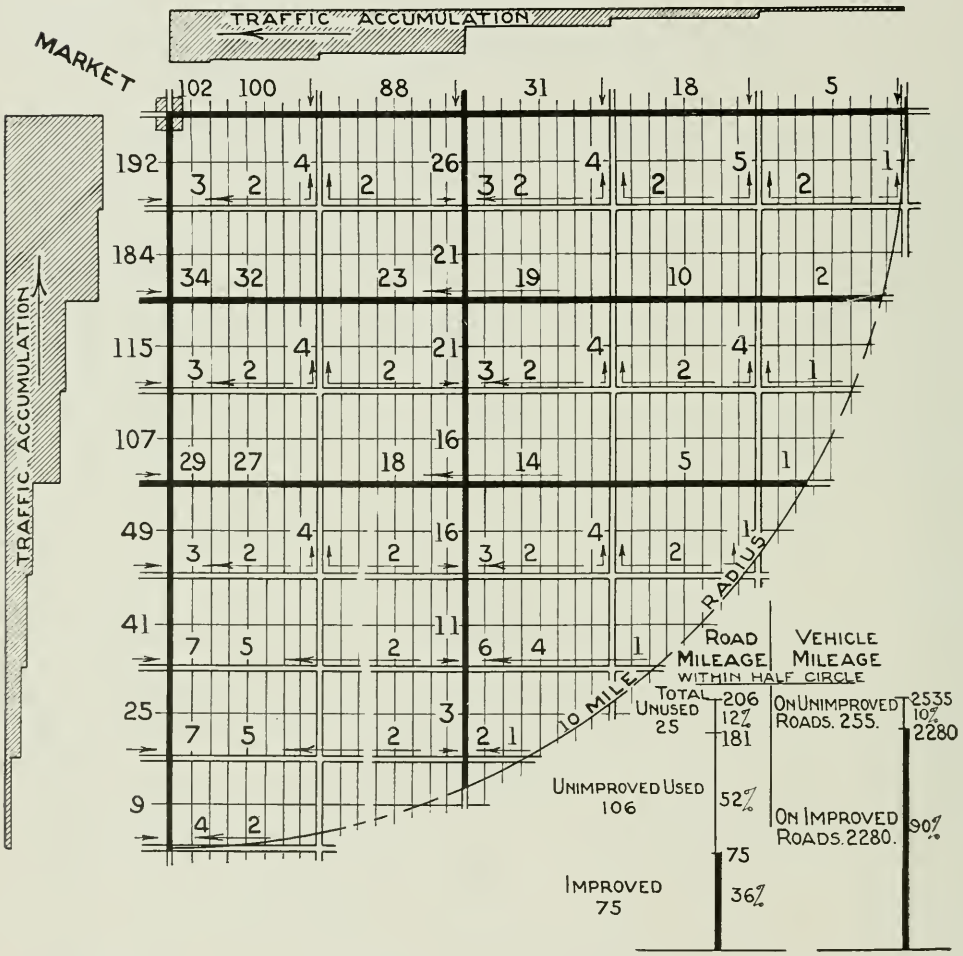


Traffic Chart No. 5.

Chart No. 5 shows two secondary concession roads improved, with the result that traffic entering the market centre is still more concentrated on the main side-road than in Chart No. 2.

The mileage improved and proportionate advantage in vehicle mileage carried on the improved roads is the same as in Chart No. 4.

The advantage of this distribution of good roads is to be considered largely in relation to the benefit or otherwise of accumulated traffic on the Main Side Road entering the market.

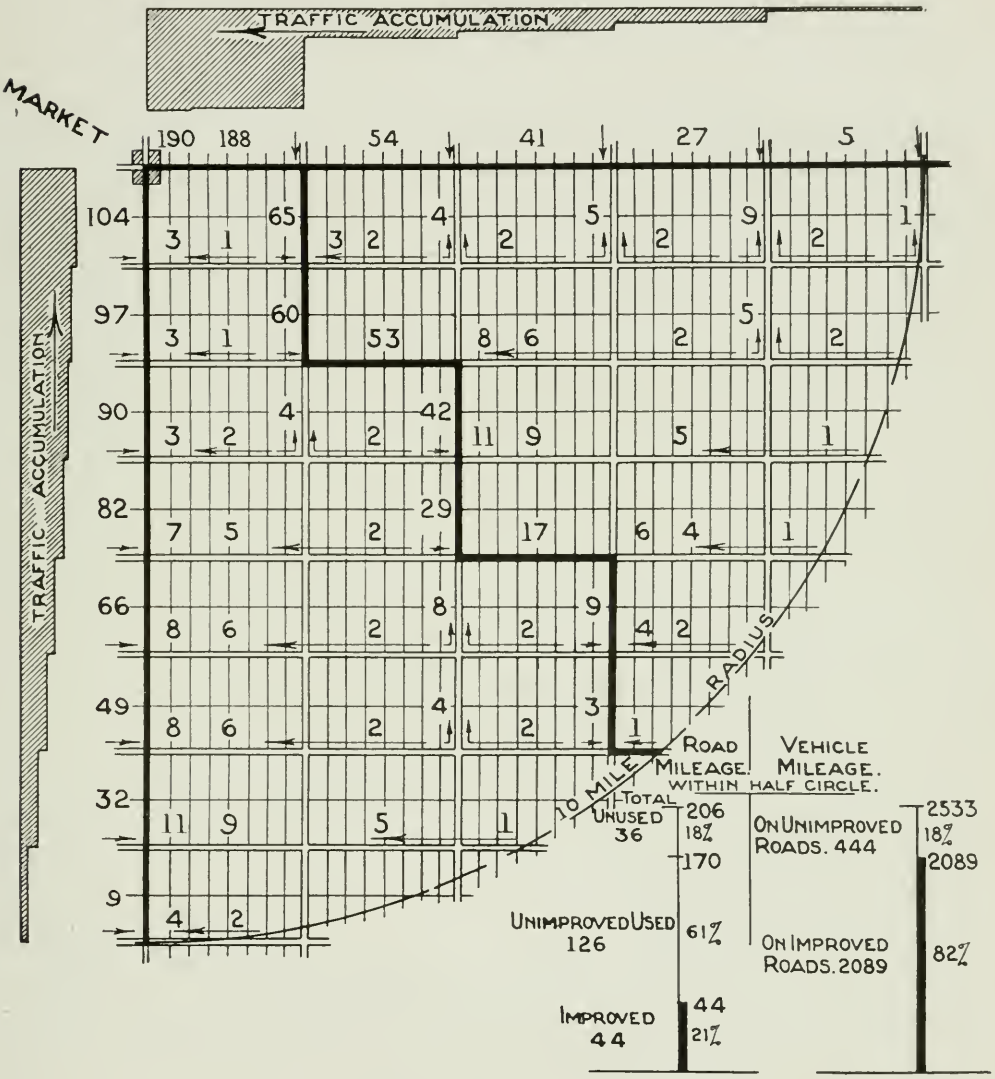


Traffic Chart No. 6.

Chart No. 6, showing three secondary roads improved, effects a better diffusion of traffic than does the distribution in Chart No. 5, and there is less concentration of traffic on the main side road at the market centre.

The mileage diagram, however, shows that the improvement of 72 miles out of 206 (36%) carries 90% of the vehicle mileage. Compared with Chart No. 1 it will be seen that, while the improved roads have been increased by 26% of the total, the vehicle mileage carried by them has increased only an additional 23%.

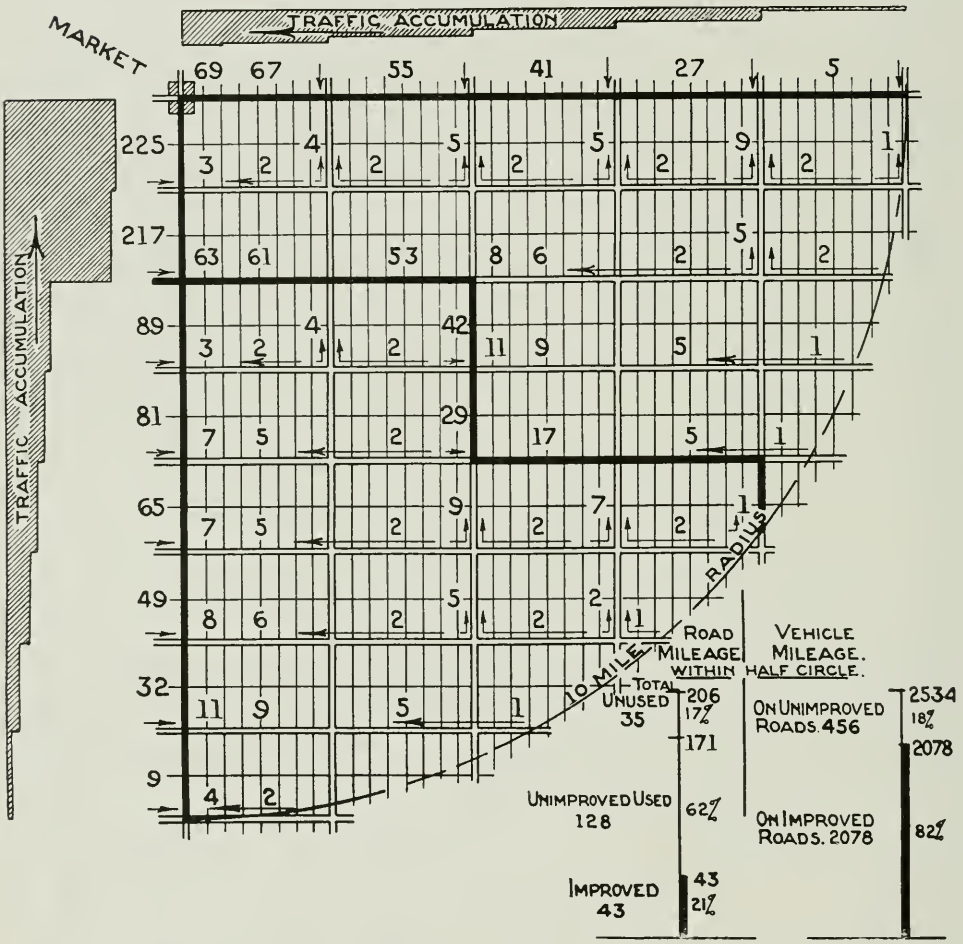
The number of vehicles carried by the extremities of the secondary roads again suggests the relative economic advantage of stopping the work approximately at their intersections.



Traffic Chart No. 7.

Chart No. 7 shows a zigzag improvement of a secondary road joining the main concession road, in which the distribution of traffic is not strikingly out of proportion to the ratios shown in Charts No. 1, 3 or 6.

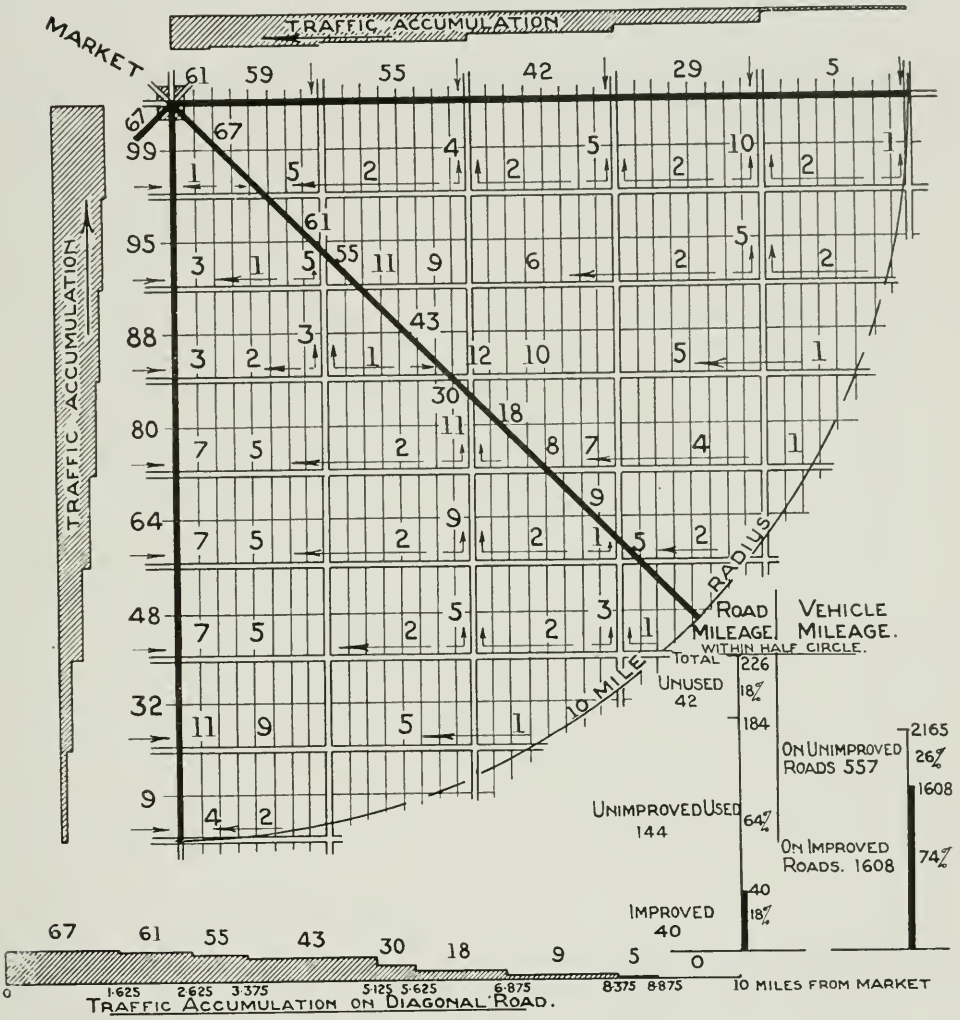
The economic advantage of the distribution of improvement as indicated by the mileage diagram, shows that the construction of 21% of the roads serves 82% of the traffic; or, as compared with Chart No. 1. an additional 11% of secondary roads serves 15% more of the vehicle mileage. This is proportionately superior to the results obtained by other designations.



Traffic Chart No. 8.

Chart No. 8 is very similar to Chart No. 7, except that a disproportionate amount of traffic is concentrated on the main side-road near the market centre—which may or may not be of advantage.

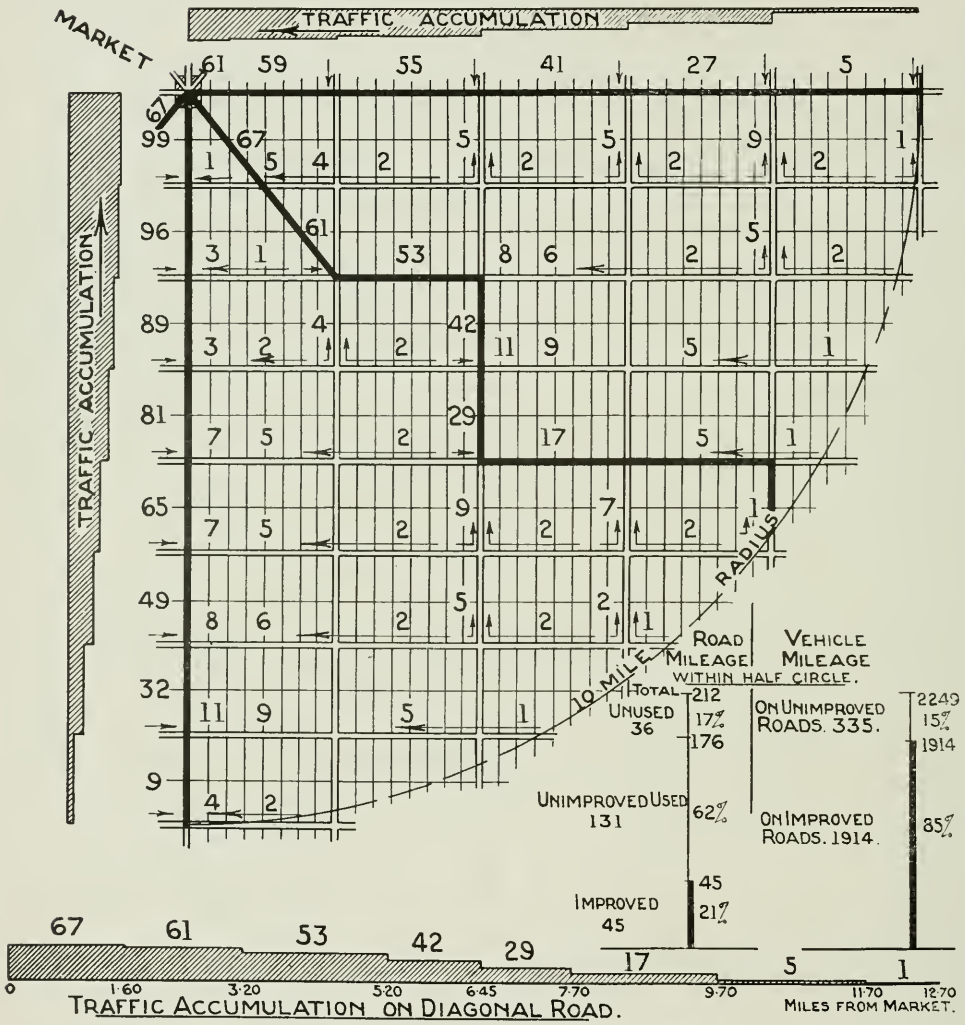
The mileage diagram and proportionate economic benefit is the same as in the case of Chart No. 7.



Traffic Chart No. 9.

Chart No. 9 shows the advantages of a radial road in distributing traffic and preventing such congestion as that shown on the main side-road in Chart No. 8.

The mileage diagram shows that the road mileage is increased; and of this increased mileage, 18% of improved roads will receive 74% of the vehicle mileage. But an outstanding advantage is that the total vehicle mileage is decreased from 2,535 miles to 2,165 miles, or over 14% of the greater. That is, the designation in this chart cuts off 14% of the vehicle mileage entirely, and carries 74% of the remainder.



Traffic Chart No. 10.

Chart No. 10 combines the advantages of the diagonal and zigzag roads, and suggests very clearly the benefit of radial roads in relation to cities as well as to rural conditions.

Traffic is diffused; the vehicle mileage is substantially reduced, and the relation of constructed roads (21%) to vehicle mileage (85%) is very favourable.

The advantages of diagonal roads, where they exist, is emphasized; and the advisability of opening up such thoroughfares in certain cases is suggested by this chart.

As a specific application, the chart suggests the very great value which main thoroughfares would have, radiating diagonally from the vicinity of the intersection of King and Yonge Streets, Toronto, in relieving the congestion of traffic on Yonge Street.

APPENDICES.

A. County Road Inspection.

B. Testing of Materials.

C. Non-Asphaltic Road Oils.

D. Traffic Census Statistics.

Appendix A.

COUNTY ROAD INSPECTION.

To W. A. McLean, Esq., C.E.,

Chief Engineer of Highways,

Ontario.

Sir.—I beg herewith to submit to you a summary of work done in the various counties of Ontario under the Highway Improvement Act to the end of the season of 1914. Outstanding features of the work in each county are also briefly noted.

The work of 1914 was inspected at intervals by engineers of this Department, several visits having been made to each county during the season. A noticeable feature of the year's work was the large number of special visits made on request of the County Road Superintendents for consultation and advice. With the increased number of engineers available for this purpose, it was possible to visit the counties with greater frequency and in advance of contemplated work, to inspect work during progress, and to offer suggestions making for increased efficiency of operations and improved quality of work. There have been numerous indications that this widening of the scope of the Government's work is much appreciated by the county officials who, in addition to deriving direct benefit from the increased assistance, have been brought into closer touch with the Department of Public Highways, which is reflected in a clearer understanding of the requirements of the Department with respect to County Road construction, and a keener desire to raise the standard of their work.

Respectfully submitted,

(Sgd.) Wimund Huber,

Assistant Engineer.

Parliament Buildings, Toronto,
November 1st, 1915.

CARLETON.

Work on Carleton County Roads was begun in 1910, when 220 miles were assumed. To date a total of about 60 miles has been graded, and nearly all metalled.

Road construction is divided between limestone, fieldstone, and gravel roads. Material has been used rather sparingly, and on several of the stone roads, insufficient water has been used, leaving the metal imperfectly bound, with much loose stone on the surface. Limestone of good quality is found at many points in the southern part of the county, while excellent gravel is obtainable in the north.

The efficiency of the county's operations is impaired by faulty organization, and a number of changes will be necessary before the benefits of a county road system can be fully realized. The chief defect lies in the appointment of foremen. The work is supervised by a county road superintendent who directs a foreman in each township. These foremen perform similar work for their respective townships, and

attention to the duties of this dual office seriously affects their efficiency in relation to the county work. In thus employing a large number of men part time only, the county cannot obtain the same results as would be possible with three or four foremen permanently employed.

The county is well supplied with machinery, including three steam rollers and one complete crushing outfit. Other crushers owned by the townships are also occasionally utilized. Sufficient money is not raised annually, however, to keep three outfits continuously employed, and some of the equipment is consequently compelled to stand idle for a part of the season.

The total expenditure in Carleton County to the end of 1914 has been: Road construction, $138,962.45; bridge construction, $25,014.71; machinery, $15,137.20; superintendence, $5,614.29. Total, $184,728.65.

Arrangement of Crushing Equipment—No. 1.
Stone in quarry buckets is raised by a crane to a platform above hopper leading to Crusher.

The present County Road Superintendent is Mr. Samuel McClure, Galetta, who was appointed in 1913.

FRONTENAC.

The Frontenac County Road System was inaugurated in 1907 with the purchase of the Kingston and Perth Toll Road, 16 miles in length. Additional toll roads have since been purchased and other roads added to the system which now comprises 127 miles of the county's principal roads, all of which are located in the townships of Kingston, Pittsburgh, Storrington, Loughborough, and Portland. The northern, and sparsely settled part of the county is not included in the system.

All money expended on county roads has been raised by an annual levy on the county, no debentures having been issued. Each township pays for the work done

in it, the amount of the annual expenditure being in proportion to the equalized assessment. This arrangement bears more heavily on townships in the immediate vicinity of the city of Kingston, who are thus required to maintain certain through roads, which are used extensively by residents of other townships and of the city. In the event of the establishment of a suburban area about Kingston, the situation will be relieved by the city's contribution toward the upkeep of these roads.

Frontenac County is fortunately situated with respect to road material. At nearly all points in the county, limestone of excellent quality for road-building is to be obtained, and may usually be quarried on the roadside, reducing hauling costs to a minimum.

Returns show about 53 miles completed to date. Realizing that maximum benefits are derived from improved roads only when they are continuous, the county's policy has been to extend in each season the work of the previous year in an effort to complete each main road in minimum time. A number of the more important roads are now practically completed.

Work is of a substantial character, and carefully done. Stone is usually spread to give a finished depth of from eight to twelve inches. The appearance of the finished roads is particularly pleasing, due to careful alignment of both subgrade and metal, a good crown and absence of loose stone.

As a result of extremely favourable conditions such as close proximity of material, lack of drainage problems owing to the rolling and hilly nature of the country, and low cost of labour, together with an excellent organization of working forces, the average cost of road construction is very low, ranging for roads eight to ten feet wide, from $1,200 to $1,600 per mile.

Machinery owned by the county includes a steam roller, crushing outfit, steam drill, scarifier, grader, spreading wagons, sprinkler wagon, etc. Some stone is crushed and placed on the less important county roads by township outfits. With only a single road-building outfit, progress will necessarily be slow. The completion of the system would be hastened by the purchase of additional machinery.

Expenditure to date is as follows:—Purchase of toll roads, $24,310.79; road construction, $81,628.95; bridge construction, $33,717.09; machinery, $8,939.55; miscellaneous, $3,176.39. Total, $151,772.77.

The work is under the supervision of Mr. R. H. Fair, Kingston Station.

HALDIMAND.

Haldimand County commenced work in 1912 on its County Road System which comprises 125 miles of road. To the end of 1914, there have been graded and metalled 16 miles.

The prevailing subsoil of Haldimand is a heavy clay. Very little metalling had been done on the main roads prior to their adoption as county roads, and the majority were flat and rough. In addition to the 16 miles metalled, there has been a considerable length graded, preparatory to applying stone. The grading is of a substantial character, and provides for a roadway twenty-four feet between shoulders, with well-formed ditches running to free outlets. The standard width of metal is eight feet, with a consolidated depth of eight inches.

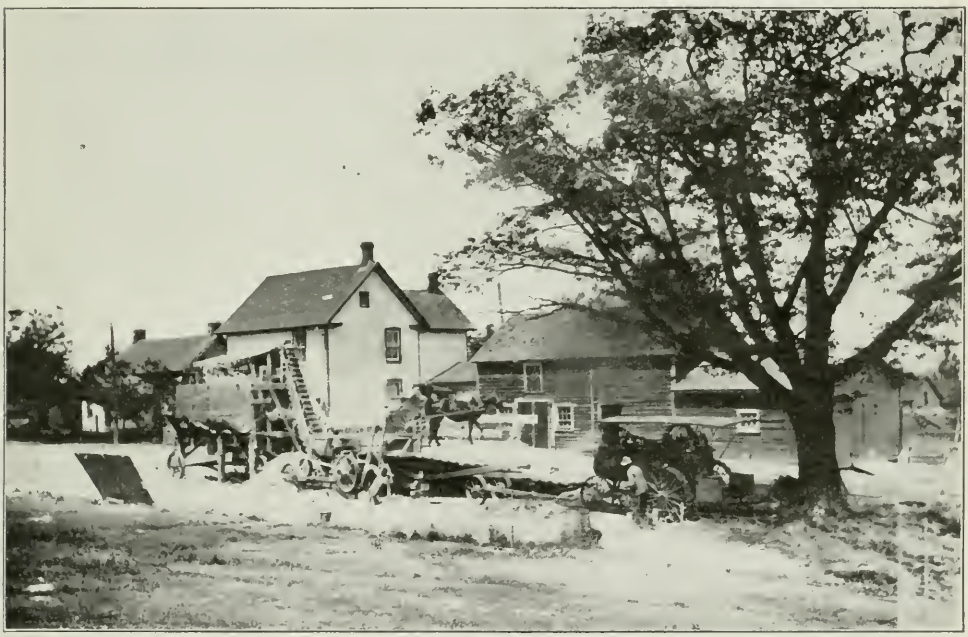
Having been constructed on a newly-formed clay subgrade, a number of the roads have already settled to a considerable extent, and will require the addition of more stone to restore their original crown.

Work has heretofore been seriously impeded through lack of organization, due to frequent changes in management, three superintendents having held office during

the first three years of operation. Until a permanent superintendent is secured, whose cumulative experience is at the service of the county, efficiency cannot be expected.

The county is well supplied with machinery including two steam rollers, two steam traction engines, one gasoline tractor, ten spreading wagons, three quarrying and crushing outfits, one small concrete mixer, three water wagons, together with small implements, etc.

Limestone of good quality for road-building occurs at a number of points in the county, the county owning and operating three quarries located at convenient centres. Some stone is also purchased from large quarries at Hagersville. Material, however, is not widely distributed, and some long hauls are necessary. For this reason hauling is done largely with traction outfits, and as a result of very favourable



Arrangement of Crushing Equipment—No. 2.

Stone is carried in one-horse carts and is dumped into a hopper from an elevated platform. Three horses and carts are necessary to keep Crusher full.

conditions, viz., long hauls and level roads, costs have been brought very low. In one case, involving the hauling of five 4-yard wagons over dry clay roads, a distance of eight miles, actual running costs have not exceeded five cents per yard-mile.

The county's expenditure to date has been: Road and culvert construction, $98,909.57; bridges, $1,932.22; machinery, $28,651.51; grants to villages, $700.00; superintendence, $5,607.24. Total, $135,800.54.

The County Road Superintendent is Mr. D. W. McBurney, Hagersville.

HALTON.

The Halton County Road System was assumed in 1907, and originally comprised about 200 miles of road. This mileage was later found to include a number of roads whose importance did not warrant their retention as county roads, and the

system has accordingly been reduced to approximately 160 miles. About 120 miles has already been improved, leaving a comparatively small mileage of less important roads to be completed.

Construction is divided between crushed limestone and gravel, more of the former being employed. Both grading and metalling have been done to a good standard for country roads. The earth subgrade is usually made 24 feet between shoulders, and stone or gravel is laid eight feet wide to give a finished depth of from ten to twelve inches. The average cost of stone roads is from $2,500 to $3,500 per mile, while gravel roads are constructed for from $1,200 to $1,700 per mile, the variation being due largely to difference in length of haul.

Many of the gravel roads are now being rolled as carefully as the stone roads, and the practice is found very profitable, in the final appearance of the road, in the much shorter time required to bring the road to a finished condition, and in the prevention of waste of material.

Road material is very scarce in the two southerly townships, Nelson and Trafalgar. Quarried limestone is usually imported, principally from Dundas. The northerly townships are more fortunately situated with regard to stone and gravel, Esquesing containing several large deposits of excellent gravel, while in Nassagaweya the county operates a number of limestone quarries for road-building in that section. In addition, a considerable quantity of fieldstone has been utilized, some having been crushed and delivered on the road for as little as 47½ cents per cubic yard, including the purchase price of the stone.

Construction work is carried on in continuous stretches, the result being long sections of completed road with no inconvenient unfinished gaps. This policy is facilitated by the fact that the county owns four rollers, one for each township; and work can be conducted in four sections of the county simultaneously. Other machinery owned by the county includes four crushing outfits, one traction engine, four graders, tank wagons, dump carts, plows, scrapers, etc.

The County Road System includes a great number of bridges, all the larger ones of which have been renewed in a permanent manner. Many concrete beam bridges with open railings have been constructed and, careful attention having been given to their finished surface, they present a good appearance as well as forming useful and durable structures. Most important of the bridges is the reinforced concrete viaduct spanning the Oakville Creek on the Middle Road in Trafalgar township. It consists of a central reinforced concrete arch with a clear span of 135 feet and 50 feet high, with eight approach spans consisting of reinforced concrete beams on reinforced concrete bents, the total length of the bridge being 474 feet.

Expenditure to the end of 1914 has been as follows:—Road construction, $255,380.88; bridge construction, $93,592.58; machinery, $20,535.26; special grants to towns and villages, $23,843.20; superintendence, $5,800.00. Total, $399,151.92.

The County Road Superintendent is Mr. J. G. Wilson, Burlington.

HASTINGS.

Hastings County was one of the first to demonstrate the advantages of a County Road System, and for many years prior to the passing of the Highway Improvement Act, the leading roads had been under the jurisdiction of the county council.

The present system under the Highway Improvement Act comprises 472 miles of road, located in the southerly nine townships of the county. This mileage, representing nearly one-third of the total road mileage of the townships in which the roads are situated, is excessive and more than can be properly cared for by the

county's organization, the result being that, while the main roads have received the attention their importance demands, the less important ones have been neglected.

Heavy expenditures on bridges, of which the county contains a great number, including many large and costly structures, have reduced the amount available for road construction. Many of the old bridges had, as is too often the case, been neglected till in a dangerous condition. A number of failures occurred almost simultaneously, and prompt action was required of the county. All recently built bridges have been constructed by day-labour. The organization of a number of bridge-building gangs, each in charge of a competent foreman, has proved successful and economical. About sixty permanent bridges, mainly reinforced concrete beam spans and arches, and many concrete culverts have been constructed. The appearance of most of these structures might have been improved at very slight extra cost, by closer attention to the finished surface.

The majority of the main roads had been previously graded and metalled, leaving the work practically one of resurfacing. About one-half the total mileage, representing the more heavily travelled of the county roads, has thus been resurfaced with crushed stone or gravel, both of which are plentiful at nearly all points on the system.

The total expenditure under the Highway Improvement Act, to the end of 1914, has been: Roads, $184,643.54; bridges, $222,801.47; other expenditures, $25,218.14. Total $432,663.15.

The County Road Superintendent is Mr. H. G. Bleecker, Frankford, who has held that position since 1904.

LANARK.

Work on Lanark County Roads commenced in 1903 with the purchase of a number of toll roads. Actual construction work began in 1904, and practically the entire system, comprising 98 miles of road, has now been graded and metalled.

Very little attention, however, had been given to the bridges on these roads prior to 1913. During 1913 and 1914 the old wooden bridges at three important points were replaced by modern structures of concrete or steel. A number of others will require immediate attention.

Lanark County is plentifully supplied with excellent road material, the majority being red gneiss. A large amount of fieldstone, a more uniform quality of red granite than is usually found, is also used. The practice, generally, has been to allow the traffic to compact the stone, a practice which causes much inconvenience for a long time after the stone has been deposited on the road, and which is apt to leave the consolidated road flat and rutted. Owing to the good care given the roads of Lanark County during the first few months after the stone is applied, the roads after consolidation show a well rounded cross-section and a fairly smooth profile. This is due to the fact that loose stone which would otherwise become scattered and wasted, has been systematically raked back into the newly-formed ruts during the period of partial consolidation. In spite of the inferior method employed, the main roads of this system are in excellent condition, their present good form contrasting strongly with their condition before being assumed by the county. Traffic on these roads is light as compared with most other counties in the Province, as it is principally of a local character, with little through travel.

Systematic repair work has been undertaken by the county, with the intention of preserving the original investment and continuing the advantages flowing from roads of the best class.

The county's machinery consists of a complete portable stone-crushing outfit with traction engine, water tank, and dump wagons, and two graders. In addition, township outfits are frequently employed to crush stone for the county roads.

In addition to the machinery, the county's equipment includes a complete camp outfit for the men and teams. This has been found of great service in keeping the men together during evenings and rainy days, eliminating long walks to and from work, and in promoting the general contentment of the workmen.

To the end of 1914, the expenditure has been: On roads and culverts, $120,491.65; on bridges, $28,782.89; on purchase of twenty miles of toll road, $19,346.60; other expenditures, $37,514.88. Total expenditure, $206,136.02.

The work is under the supervision of the County Road Superintendent, Mr. William Watters, Innisville, who was appointed in 1914.

Arrangement of Crushing Equipment—No. 3.

Stone carried from the quarry face in small cars operated over portable steel tracks.

LEEDS AND GRENVILLE.

The Leeds and Grenville County Road System was established in 1910, and includes 247 miles of road, of which 130 miles have been returned to date as completed. While the roads designated are parts of the main roads of the counties, they are not continuous, and the efficiency of the system as a whole is partially destroyed by its disconnected character. Sections of county roads are frequently found to alternate with poorly-kept township roads, and until these connecting sections are assumed as county roads and constructed to a suitable standard, the united counties will not derive full benefit from their road system.

Good road-building material is plentiful in all parts of the counties, the majority of stone used being granite fieldstone, with limited quantities of quarried limestone and gravel. All stone is crushed by contract, the counties employing constantly three crushing outfits. In the case of fieldstone, the material is usually hauled to the roadside during the winter months, when teams are plentiful and roads good, and piled ready for the crusher.

Main roads are built from 10 to 12 feet wide, on sub-grades from 25 to 30 feet in width. The metal is well crowned and thoroughly rolled. Less important roads are graded 20 to 25 feet wide and surfaced with 7 to 9 feet of crushed stone, which is occasionally left to be consolidated by traffic.

The machinery equipment is ample, comprising three rollers, four water wagons, six graders, and numerous wheel scrapers, drag scrapers and plows. Grading is done partly with horses and partly with rented traction engines.

The county's expenditure to date has been: Roads, $219,241.34; bridges, $24,508.18; machinery, $11,553.90; special grants to towns and villages, $28,556.79; purchase of toll roads, $2,100.00; superintendence, $7,754.89; total, $293,715.10.

The work is under the supervision of the County Engineer, Mr. E. R. Blackwell, C.E., Brockville; and of a permanent Commission of which the chairman is Mr. J. A. Sanderson, Oxford Station.

LENNOX AND ADDINGTON.

The County Road System of Lennox and Addington was adopted in 1906, and with recent additions, comprises 171 miles of road. The roads are all located in the southerly seven townships, which constitute the more thickly populated section of the county. To date, about 83 miles, or less than one-half of the total mileage, has been graded and surfaced with crushed stone. Very little gravelling has been done, the prevailing material being fieldstone with quarried limestone at intervals.

A small amount of money for county road work has been raised by debenture issues, but the greater part is obtained by an annual levy, the various municipalities contributing in proportion to their equalized assessments. Money raised in each township is expended in that township, and since there is great variation in the assessments of the different municipalities, the greater part of the completed work will be found in the highly assessed townships, regardless of the actual needs of the others.

Much of the work done during the first few years of operation was of a very light character, which is shown in the present badly worn condition of the roads first constructed. The small amount now raised annually for county road purposes is nearly all devoted to construction work, so that systematic maintenance of these roads has not yet been attempted, and a further appropriation for this purpose is much needed.

The work was originally in charge of two superintendents, one in the north and one in the south, but this division of responsibility having been found unsatisfactory, the entire work was later placed in the hands of one superintendent.

Recent construction has been of a more substantial nature, the depth of stone having been increased from five or six inches to eight or ten inches and in some cases even more. In a number of instances removing the tops of knolls would have materially improved the grades, and more attention should be paid to alignment.

The county's machinery includes one steam roller, one complete crushing outfit, two graders, together with spreading wagons, tank wagons, plows, scrapers, etc.

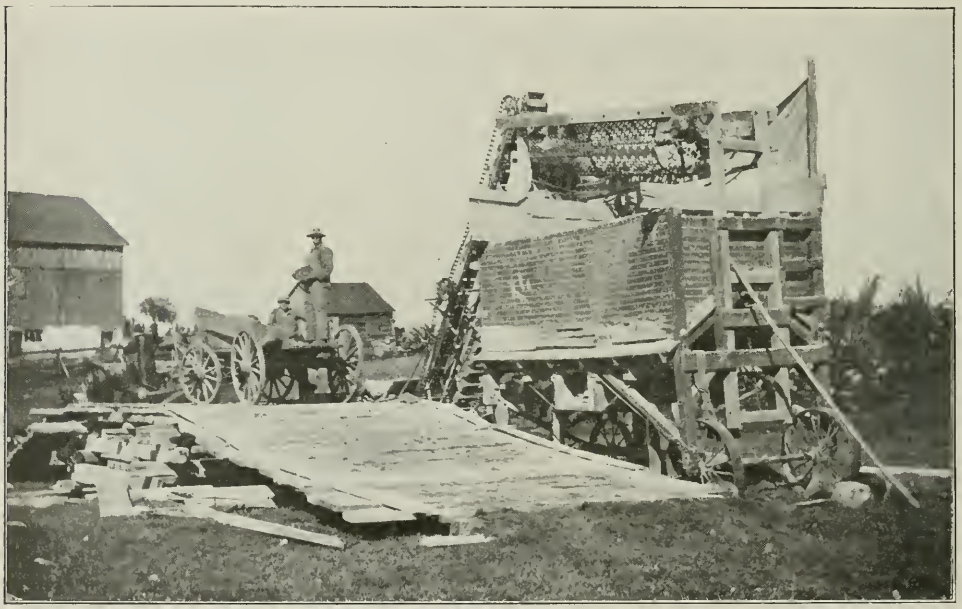
The total expenditure under the Highway Improvement Act to the end of 1914 has been: Roads and culverts, $86,249.47; bridges, $20,481,42; machinery, $19,494.53; other expenditures, $20,845,28; total, $147,070.70.

With an average expenditure on road construction of less than $10,000 per year, and the use of only a single road-building outfit, progress on a road system of such magnitude is necessarily slow. The interests of the county would be served by an increase in the expenditure and the purchase of an additional outfit.

The County Road Superintendent is Mr. T. V. Anderson, Napanee.

LINCOLN.

The Lincoln County Road System, established in 1904, comprises the Queenston and Grimsby stone road. This road extending across the county, 29 miles in length, exclusive of that part of it lying within the City of St. Catharines, has for many years been one of the most important through roads in Ontario,



Arrangement of Crushing Equipment—No. 4.

An elevated platform above Crusher; one team to three wagons; one wagon being emptied; one full; and one being filled.

carrying most of the traffic between New York State and Ontario cities, in addition to serving the heavy local traffic of the Niagara Peninsula. Originally a toll road, it was purchased and maintained by the county, and in 1904 placed under the supervision of a single road superintendent. At this time the surface had become badly worn, flat and rutted, the side ditches had been neglected, and many bridges and culverts were in need of renewal.

As a result of operations under the Highway Improvement Act, the road has been gradually brought up to a greatly improved standard. Grading has been done over the entire length, ditches have been widened, deepened, and straightened, new stone has been applied, the whole well-crowned and nearly all old wooden culverts and bridges have been replaced by durable concrete structures.

By means of systematic repair work the condition of this road is not only maintained, but actually improved from year to year, in spite of the growing intensity of through traffic and the increasing preponderance of motor vehicles.

The plan of operations in maintenance includes the resurfacing of certain parts of the road each year and the oiling of the entire length. The oil used contains 10 per cent. asphalt and is applied to the road at the rate of about ⅜ gallon per square yard. The total cost of treatment where the road has been covered over a width of 12 feet is approximately $100 per mile. In addition to eliminating dust and preventing undue wear, the oil promotes the comfort of those dwelling along the road and also of all users of the road.

The total expenditure under the Highway Improvement Act to the end of 1914 has been: Road construction, $99,258.73; bridges, $11,218.16; machinery, $5,891.01; superintendence, $6,877.84. Total, $123,245.74.

The county's machinery equipment includes a steam roller, stone crusher, two tank wagons, two road graders and small tools.

Mr. W. B. Russ, Grimsby, has held the position of County Road Superintendent since its creation in 1904.

MIDDLESEX.

The Middlesex County Road System under the Highway Improvement Act was established in 1906, when a special Act of the Legislature permitted the county to improve certain roads, the work being carried on by the township councils. This arrangement proved unsatisfactory and a by-law was passed by the county in 1907 assuming a system of county roads in conformity with the Highway Improvement Act. Work was commenced under this by-law in 1908. The system includes approximately 230 miles of road, some of which were old toll roads and the more important of which had been substantially constructed by the county forty to fifty years before.

The main roads having already been well graded and heavily gravelled, reconstruction consists largely of cutting off the sod shoulders, resurfacing with gravel and laying tile drains where needed.

Gravel is the principal road material, and is widely distributed. Some localities, however, have no local supply, and will be forced to import their road metal. A small amount of crushed stone has been used for road-building in Middlesex, but its use so far has been confined to short experimental sections.

The machinery equipment, consisting of one steam roller, one stone crusher and one traction engine, is inadequate to the needs of a large county such as Middlesex. Most of the gravel roads constructed are, owing to lack of rollers, left to be consolidated by traffic, which, on heavily travelled roads causes a waste of material, inconvenience to traffic, and inferior roads when finished.

Middlesex County Road System contains a large number of bridges many of which are long steel structures spanning wide rivers. The heavy expenditure on bridges being practically at an end, the county will now be in a better position to prosecute the work on the remaining roads of the county system.

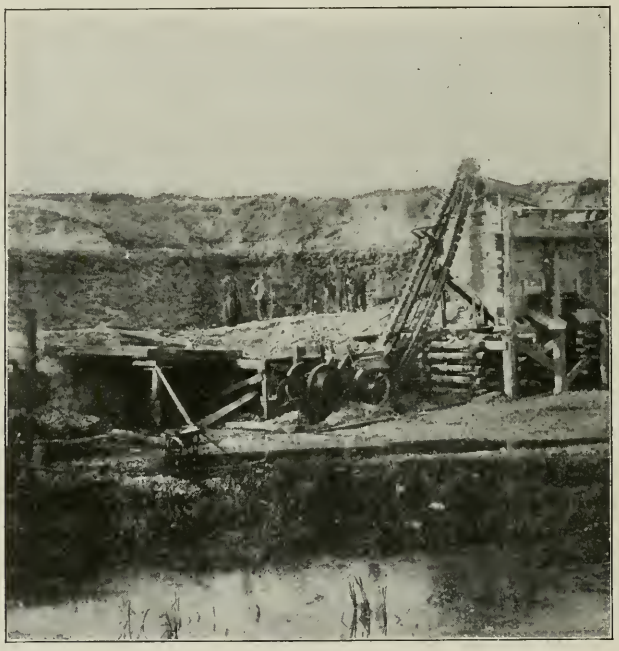
The present County Road System does not include all the main roads of the county, having been designated to satisfy the local interests of the townships, rather than the needs of the county as a whole. This leaves a disconnected system, and steps have been proposed to increase its usefulness by linking together certain sections of the existing system and adding other roads whose importance warrants their adoption as county roads.

Expenditure to date has been: Roads, $179,532.14; bridges, $168,121.47; machinery, $6,283.15; other expenditures, $16,572.22; total, $370,508.98.

The work is under the direction of Mr. Charles Talbot, C.E., County Engineer, London.

OXFORD.

The Oxford County Road System was established in 1904, when by a special Act of the Legislature, the county was empowered to purchase certain toll roads, remove the tolls and provide for their maintenance and for the construction of other main roads. Work was carried on under this Act for three years, but finding it unsatisfactory, the county in 1907 passed a new by-law assuming 256



Arrangement of Crushing Equipment—Oxford County—No. 5.

Crusher below floor of quarry; limestone fed to hopper over Crusher, and crushed material elevated to revolving screen and storage bin.

miles of road. The system was again revised in 1913, when several roads were changed and unimportant roads removed, the present system including 224 miles.

The county was originally divided, for county road purposes, into two sections, north and south, with a road superintendent directing the work in each. In 1913, this division of responsibility was done away with, and a single superintendent appointed.

To date, about 120 miles of road have been constructed. The standard road consists of an earth sub-grade 25 to 30 feet between shoulders, with a metal surface 8 feet wide and 8 to 10 inches thick. Tile drains have been laid where necessary. Metal used consists of crushed gravel, obtained at many points in the county, and crushed stone, imported from Dundas, Hagersville and St. Mary's,

used where gravel is not locally available. Some of the less important roads are constructed of natural pit gravel. Where crushed stone is used, there is a tendency to add screenings before the stone has been properly consolidated with the roller. Binding material is also used in larger quantity than is necessary, forming a coat which becomes muddy in wet weather.

The county owns two steam rollers, four crushing outfits, two graders, three sprinkling wagons, one traction engine, four traction cars, and small implements. Much of the hauling of material is done with the traction engine and cars.

The total expenditure to date has been: Purchase of toll roads, $53,034.80; roads, $304,418.61; bridges, $76,539.37; machinery, $30,984.38; grants to villages, $6,073.14; superintendence, $13,107.17; total, $484,157.47.

The County Road Superintendent is Mr. William Forbes, Woodstock.

PEEL.

Work on Peel County Roads was commenced in 1907, when a system comprising 102 miles of leading roads was assumed. Work has been diligently prosecuted, the more important roads having received first attention, and completed work now represents about 80 per cent. of the total county road mileage.

The principal road in Peel County is the road from Port Credit to Orangeville, known as Hurontario Street. This road, 38 miles in length, which has recently been completed, is one of the longest continuous stretches of macadamized road in Ontario. The extension of the work over a period of seven years, and the great change in traffic conditions during that time, together with the fact that no systematic maintenance work has heretofore been attempted, account for considerable variations in the present condition of different sections of the road. Considering the heavy traffic the road is now carrying, and the lack of maintenance, the general condition of the road is good, those sections which originally received the heaviest construction now appearing to best advantage.

Road-building material is not evenly distributed in Peel County and much of the metal used must be imported. The townships of Toronto and Toronto Gore are practically without either stone or gravel. Some stone has been obtained from the river bed of the west branch of the Humber River. In Caledon and Chinguacousy Townships, fieldstone of good quality is fairly plentiful, and good gravel is found, in limited quantities, in Albion Township.

Recent construction provides for a width of 8 to 10 feet of metal and a consolidated depth of about 10 inches. It has been found here, as elsewhere, that for satisfactory wearing qualities, present day traffic demands that roads be built with a substantial depth of stone or gravel.

With the exception of a few small bridges, all permanent structures have now been completed. There are no very large bridges and few exceeding fifty feet. Reinforced concrete predominates, and the design and exterior finish of the majority indicate a desire to take advantage of the good appearance of concrete as well as its durability.

The county owns one steam roller and two crushing outfits together with minor machinery, in addition to which two rollers and two stone crushers are frequently borrowed from the townships.

Expenditure to date has been: Roads, $297,384.06; bridges, $47,177.23; machinery, $19,266.82; grants to towns and villages, $6,867.56; superintendence, $7,459.34; total, $378,155.01.

Work is under the direction of the County Engineer, Mr. C. R. Wheelock, C.E., Orangeville.

PERTH.

Perth County System was inaugurated in 1907, and consists of 187 miles of road, of which approximately 70 miles have been returned as completed.

Work has consisted principally of grading and straightening the old road-beds, resurfacing with gravel, and laying tile drains where required.

The north-eastern section of the county, comprising the Townships of Wallace, Elma, Mornington, Logan and Ellice, is very level, the soil being a heavy clay, these conditions offering serious problems in drainage. Suitable road material is not plentiful in these townships, and gravel must be hauled several miles.

In the remaining section, including the townships of Hibbert, Fullerton, Downie, North and South Easthope and Blanshard, conditions are more favourable for road construction. The subsoil is more porous and the ground is sufficiently rolling to afford good drainage without requiring extensive hill-cutting. Good gravel is plentiful, being obtainable at numerous points. This gravel, which contains much large stone, is usually crushed. At St. Mary's are located several limestone quarries. Up to the present, however, few stone roads have been built by the county.

General oversight of the work is centralized in the County Engineer, who directs a road commissioner or foreman in each township. No debentures for road-making purposes have been issued, all money being raised by annual levies, and money contributed from each township is spent on the county roads of that township.

There has been a tendency in Perth County to perform the work in a series of patches, rather than in continuous stretches. For this reason progress under the County Road System has not been so marked as it might have been, had the policy of the county been to build continuously.

The county's machinery equipment includes a number of crushing outfits, one steam roller purchased in 1914, and three horse rollers. Horse rollers have been found generally unsatisfactory, and those owned by Perth County have been used only occasionally.

Expenditure to date is as follows: Road construction and tile draining, $155,351.43; bridges, $55,104.97; other expenditures, $22,168.00; total, $232,624.40.

The County Engineer is Mr. John Roger, C.E., Mitchell.

PRINCE EDWARD.

Work on the Prince Edward County Road System was commenced in 1907. The system originally comprised 54 miles, but was extended in 1911 to include 122 miles of main roads. Of this mileage, about 85 miles have already been completed.

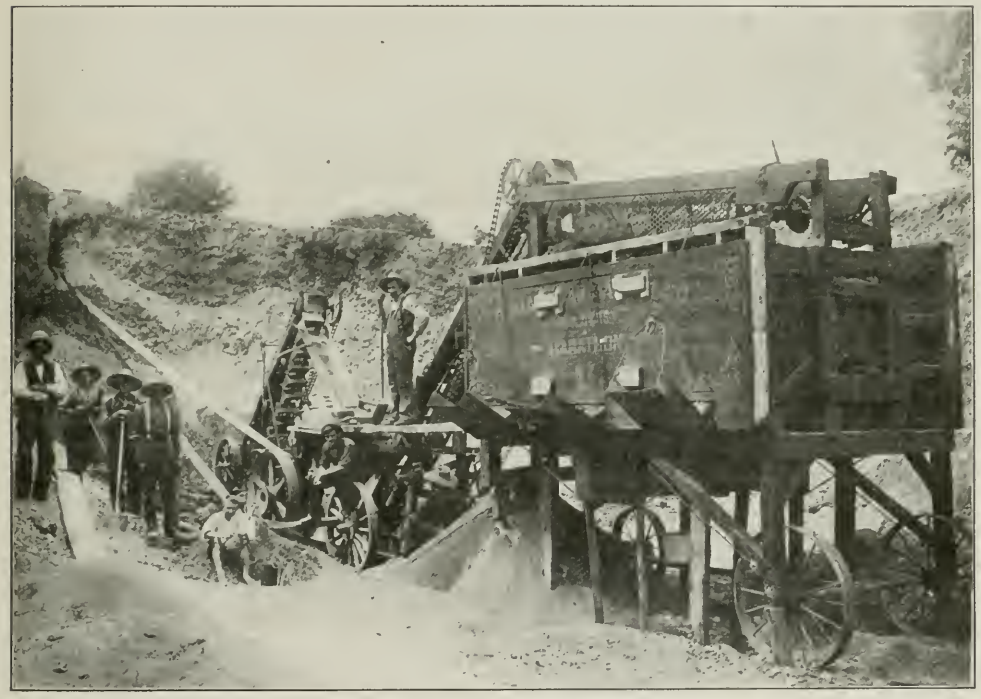
The roads have been built to a good standard for county traffic, well graded, and surfaced with crushed stone from 8 to 12 inches deep. Owing partly to the rather soft quality of the local limestone, and partly to lack of tile drainage of which several sections stand in need, a number of roads have become flat and rutted. Also, many of the roads first built now show a rough surface due to the use of crusher-run stone, containing coarse material which should have been removed by screening.

Special attention has always been given to rolling, and to the appearance of the finished road, the result being many miles of road on which no loose stone is seen.

Two outfits are continuously employed and a third is operated part of the time. The county owns two steam rollers, and frequently borrows a third from the Town of Picton. The other machinery includes four crushing outfits, four graders, dump carts, tank wagons, plows, scrapers, etc.

Quarried limestone is used almost exclusively, being taken from quarries owned by the county. Much of the stone shows a tendency to wear rapidly, but the low cost at which it can be placed on the road, and high freight rates on imported stone render its use economical even though more frequent resurfacing may be necessary.

Prince Edward County Road work is directed by a commission of three, including the Warden of the county and the County Road Superintendent, the latter



Arrangement of Crushing Equipment—Middlesex County—No. 6.

Power from a Traction Engine on top of the bank of gravel; gravel being fed to the Crusher by bucket elevator; material passing through a revolving screen to storage bin.

having charge of all construction work. The efficiency of the organization has been somewhat impaired by the frequency with which the road superintendents have been changed, no less than five men having occupied this position since 1907. Thus, one of the greatest assets in road-building, viz.: accumulated experience gained from successive years' operations has been largely lost to the county.

The total expenditure to date on construction has been: Roads, $220,625.84; bridges, $10,780.04; machinery, $30,325.05; other expenditures, $9,652.46. Total, $271,383.39.

In addition to the above-mentioned construction work, a large amount of maintenance work has been done, including resurfacing about 20 miles of the first

roads built. One and one-half miles of road leading to the Town of Picton has been treated with a light grade of tar as a dust preventive. About one-fifth gallon per square yard was applied over a width of 9 feet, and covered with sand, the entire work costing about $200 per mile, or 3.8 cents per square yard. By thus undertaking extensive maintenance work the county is showing a commendable desire to keep the roads up to their original high standard.

The present County Road Superintendent is Mr. H. D. Cleminson, Picton.

SIMCOE.

The County of Simcoe adopted the County Road System in 1903, assuming about 425 miles of road, later additions increasing the mileage to about 475.

During the first seven years the greater part of the system was graded and gravelled, but the policy of the county authorities being to cover as large a mileage as possible with a small amount of money, the average work was not as substantial as this Department desired. Owing to the light character of this work, and the lack of systematic maintenance, many of these roads are in need of complete resurfacing, and the greater part of the money now raised for county road purposes is required for repair work.

Of recent years the annual expenditure on road-bed construction has been considerably reduced, and attention has been directed mainly to the construction of permanent bridges, of which the county requires a great many. The majority of these are now in place, and include a large number of well-designed, carefully built structures of steel or concrete. With the completion of the bridges, the county should be in a position to complete the construction of the roads and to efficiently maintain them.

The majority of Simcoe County Roads are surfaced with gravel, this material being fairly abundant in the south part of the county. Limestone is plentiful in the north part, and some roads are constructed of this material.

The county's machinery equipment includes fourteen graders, four horse rollers, three stone crushers, and a large number of drag and wheel scrapers and rooter plows.

Expenditure on county roads has been as follows: Roads and culverts, $329,836.00; bridges, $121,004.82; grants to towns and villages, $46,847.85; machinery, $9,277.53; other expenditures, $8,450.00. Total, $515,416.20.

The County Road Superintendent is Mr. F. G. Campbell, Randall, Ont., who was appointed in 1914.

WATERLOO.

The County of Waterloo established its County Road System in 1908, assuming 175 miles of main road. A total of approximately 37 miles has been constructed to date under the Highway Improvement Act.

A large part of the county's total expenditure on road construction has been made on a number of disconnected patches, rather than on the building of roads in continuous stretches. Improvements made in this way are largely temporary, and this practice wherever followed has a tendency to weaken public interest in county road work, and to postpone indefinitely the realization of a completed system.

Gravel abounds in the southern townships of the county, but the northern section is lacking in road material of any kind. Most of the roads so far constructed have been built of gravel. A short mileage of the more heavily travelled

roads, together with some short sections in the northern townships which must import their material, have been metalled with crushed limestone. Much of the gravel used contains large stones and is crushed before being placed on the road.

The county's machinery includes one steam roller, two crushing outfits, two graders, etc. A second roller would be very desirable, since many of the gravel roads now built must depend on traffic for their consolidation, which, on such heavily travelled roads, constitutes a wasteful and inefficient method of improvement.

A section of the main road between Berlin and Preston has been treated with a light grade of refined tar for the prevention of dust and preservation of the road surface. Approximately one-quarter gallon per square yard was applied over the entire width (18 feet) of the road and covered with fine gravel, at a total cost of $380 per mile or 3.6 cents per square yard. This application served for an entire season, and required slight repairs the following season, amounting to less than one cent per square yard.

Waterloo County has a greater number of urban centres (together with the Cities of Berlin and Galt) than has any other county in the Province, and from this cause, there was a tendency, during the initial stages of the county road system, to seek the improvement of main roads within and leading to such centres; a condition which has created a maximum outlay under the heading of "Grants to towns and villages." These grants have diminished under the Highway Improvement Amendment Act of 1911.

In common with a number of other counties, whose road systems include a large number of bridges, much of the money of Waterloo County available for county road work has been expended on permanent structures, which include several long steel spans and a number of concrete arches of good design. Bridge building on a large scale has been practically completed, and the county should now be in a good position to prosecute the work of road construction with increased vigour.

Total expenditure to date has been as follows: Roads, $68,177.29; bridges, $51,665.07; machinery, $5,949.13; special grants to towns and villages, $41,832.30; superintendence, $2,965.95. Total, $170,589.74.

The County Road Superintendent is Mr. M. D. Hallman, Berlin.

WELLAND.

Welland County commenced work in 1912 on its system of 153 miles of main roads. In three years' operations, 44 miles have been completed.

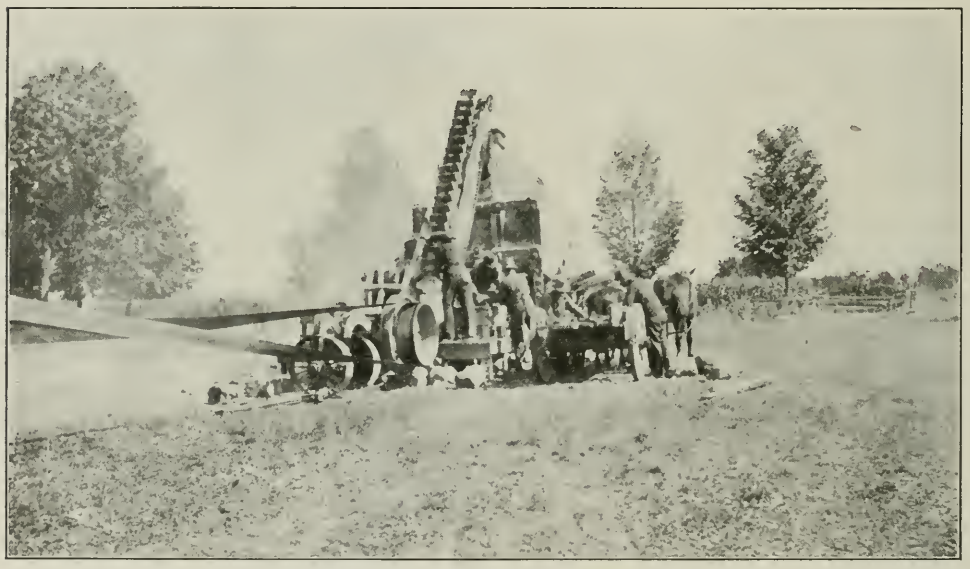
The county is flat and the subsoil is usually a heavy clay, both conditions demanding careful attention to drainage. Water must frequently be carried long distances along the side ditches before an outlet can be secured. Many of the roads, before improvement, show the bad effects of water which has penetrated the subgrade instead of being carried off.

Grading is in all cases performed by the county. Part of the stone is laid and finished by contract, the remainder being done by the county's outfits. The standard road consists of a subgrade 30 feet wide between ditches, with a stone surface 9 feet wide, having a consolidated depth of 9 inches. A subgrade 24 or 27 feet wide would satisfactorily serve the traffic of a majority of the roads, would give better surface drainage and would be more cheaply maintained and kept in repair.

Limestone is quarried at numerous points in the county, a large amount being obtained at Queenston, while some is imported from Hagersville. While road material is not distributed over the entire county, railroad facilities for handling stone are good, and, as several large quarries are situated within a emparatively short radius of any point in the county, material can be delivered with a minimum freight rate.

The policy of the county is to complete each road in as short a time as possible after construction is commenced, and work is continuous. Little time is lost moving the outfits from place to place during the season, and few unfinished gaps are left in the completed roads.

The county's machinery comprises three steam rollers, one stone crushing outfit, three gasoline tractors for hauling stone and grading, four graders, spreading wagons, tank wagons, etc. In addition to the above, two borrowed rollers



ARRANGEMENT OF CRUSHING EQUIPMENT—No. 7.

Inferior method of feeding field stone, being handed one by one to Crusher, while team is idle.

have been working much of the time, while the contractors' outfits bring the number of complete outfits operating on Welland County roads to from eight to ten.

At the present rate of progress the system should be completed in a short time, and the entire county given the benefit of much-needed improved roads.

The expenditure to the end of 1914 has been: Roads, $187,556.44; bridges, $5,457.65; machinery, $21,414.46; grants to villages, $3,000; superintendence, $3,994.04. Total, $221,422.59.

The County Road Superintendent is Mr. James Sheppard, Welland.

WELLINGTON.

Work on the Wellington County Road System, under the Highway Improvement Act, was commenced in 1903. The system, comprising 170 miles was under the jurisdiction of the county council for many years prior to the passing of

the Highway Improvement Act, and was designated at a time when team haulage was the only means of transportation. The roads selected constituted the main thoroughfares of the county, at that time, but the system as a whole has ceased to serve the purpose for which it was originally intended. Since the advent of the railroads, main routes have been changed, and in a number of cases, roads which once carried heavy through traffic are now serving purely local needs. A complete revision of the system, including the removal of certain roads whose importance has ceased, the assuming of others which have become main roads, and the redistribution of the entire system on a more equitable basis, is now under consideration by the county authorities.

The County of Wellington comprises twelve townships, and is one of the largest counties in Ontario. Under the existing arrangement which provides that some work shall be done annually in each township, it is impossible with the two crushing and rolling outfits which constitute the county's equipment, to accomplish more than a series of patches in a season. For this reason, coupled with the unsuitable location of many of the present county roads, public interest in the work has not been favourably stimulated. About 50 miles have been constructed under the Highway Improvement Act.

The general condition of the county roads is fair. As gravel is obtainable in nearly all parts of the county, maintenance is inexpensive. As a rule the roads have been well maintained, the county making an annual appropriation of $50 per mile for this purpose.

In addition to the well-distributed supply of gravel, large deposits of excellent limestone are found in the vicinity of Guelph, Fergus and Elora, at points where traffic will demand a better class of road than can be obtained with pit gravel .

Wellington has constructed many bridges on its county roads, including several long steel spans over wide rivers. For smaller bridges, reinforced concrete is generally used, the structures including a number of original designs of pleasing effect.

The county's expenditure to date has been: Roads, $174,687.93; bridges, $100,184.40; machinery, $17,264.77; grants to villages, $3,618.45; superintendence, $12,650.17. Total, $308,405.72.

The County Road Superintendent is Mr. John M. Young, Harriston.

WENTWORTH.

The County of Wentworth assumed its county road system in 1902, and, with Simcoe, was a pioneer county operating under the Highway Improvement Act. Work has consisted of the reconstruction of old toll roads and the construction of new roads. Macadamizing of the roads was practically completed in 1912, and construction work since that year has been confined to the completion of unfinished gaps and the improvement of drainage.

The system comprises 140 miles of the county's leading roads, of which the majority, radiating from the City of Hamilton carry heavy traffic. The most important is the Stony Creek Road, which carries through traffic between Hamilton, St. Catharines, Niagara Falls, and the cities of New York State, and also serves the heavy local traffic through the fruit district situated along the south shore of Lake Ontario. Other heavily travelled roads include the Dundas and Waterloo Road, the Ancaster Road running through to Brantford, Woodstock, London, etc., the Plains Road, recently assumed by the Toronto-Hamilton Highway Commission, and the Brock Road connecting the Cities of Hamilton and Guelph.

A number of these roads, particularly those constructed during the early stages of the county's work, have become badly worn, and a large amount of repair work has been necessary in recent years to keep the roads in good condition. It has been found that much of the early construction was of too light a character to successfully withstand the increasingly heavy traffic to which these roads have been subjected, the first construction having provided for a width of 8 to 10 feet on ordinary roads, increasing to from 14 to 16 feet on the roads in the immediate vicinity of Hamilton. The depth of metal was from 6 to 10 inches, and was in many cases inadequate. Many of these roads have been reconstructed with a width of metal of from 10 to 12 feet and a depth of from 12 to 16 inches, while in special cases of concentrated traffic, short sections have been built 18 to 22 feet wide.

Oiling the main roads as a means of preventing dust, and consequent wear, has been done to a considerable extent. Heavy asphaltic oils are generally used.

Insufficient Consolidation by Rolling.

being applied hot, and covered with a thin layer of half an inch stone chips. This method provides a bituminous surface which will, it is expected, with slight maintenance, last from three to five years. The average cost of such treatment is about 7 cents per square yard, and when divided by the number of years which it is expected to last, means a low cost of maintenance for heavily travelled roads.

Road material is not evenly distributed in Wentworth County. Very little gravel has been used, owing partly to its scarcity and partly to its unsuitability for roads receiving the heavy traffic which is common on the roads of this county. Stone has been almost universally used; limestone from a number of quarries owned by the county, and from Dundas and Hagersville, and fieldstone which is found in some localities. The unequal distribution of stone has necessitated some long hauls, in some cases as much as nine miles. The county has never utilized traction haulage, but team haulage has been economically done. The standard wagon-box

contains 64 cubic feet or one half cord—over two and one-third cubic yards—which contrasts strongly with the one and one-half cubic yard wagon-boxes frequently seen elsewhere. It has been found that on ordinary roads a good team will draw a wagon of this size filled with stone, without trouble. Ordinary hauling costs average from 17 to 20 cents per yard-mile, with teams at $5.00 per day. Not only is the cost of haulage considerably lower than in most other localities, but the standard of horses has been raised, it being well known that inferior teams can find no place on county road work.

The county is well supplied with machinery, which includes four steam rollers, four crushing outfits, three graders and the usual accessory machinery, such as steam drills, water tanks, plows, small tools, etc.

On actual road construction there has been expended $288,857.96; on bridges, $17,937.40; on purchase of toll roads, $74,035.79; on machinery and tools, $29,837.96; miscellaneous expenditures bringing the total to $428,420.11.

The work has been under the direction of Mr. T. R. Allison, Hamilton, since the beginning of the season of 1914.

YORK.

The York County Road System, comprising the main roads in the Townships of York, Scarboro, Etobicoke, Vaughan and Markham, was established in 1911, when an agreement was made between the county and the City of Toronto, whereby one-third of the cost of construction is contributed by the city.

The system comprises 116 miles of the main roads radiating from Toronto, including a number of the most heavily travelled roads in Ontario. These roads, owing to the inability of the townships surrounding the city to cope with the increasing traffic, had fallen into a condition of greater or less disrepair. To the end of 1914, there have been returned about 61 miles of completed work.

The class of construction varies with the requirements of traffic. In the vicinity of Toronto the subgrade of the most important roads is at least 30 feet between shoulders, with 14 feet of metal. As the roads had already been heavily stoned, and thus afforded a solid foundation for the new roadway, a depth of seven to eight inches consolidated, was considered sufficient. Other roads, whose requirements are not so great, have been graded to a width of 20 to 25 feet and metalled 10 feet wide. A small mileage of gravel road has also been built, but the short experience has already shown that traffic on even the least travelled roads of the York County System is too heavy for this class of construction.

The part of York County served by the county road system is, with the exception of a very little fieldstone, totally without stone for road-building. All material, exclusive of gravel, must, therefore, be imported. Limestone is received from Dundas, St. Mary's, Hagersville, Shaw, Kirkfield, Burnt River, Ivanhoe and other points in Ontario, and granite gneiss from Washago and Gravenhurst. Small quantities of trap-rock for experimental purposes have been secured from Cobalt and Havelock, but the high freight rates from these points to Toronto prohibit its general use.

In addition to the macadam roads, types of road constructed by the county include concrete, tar-macadam, and brick pavement. On the Lake Shore Road, now a link in the Toronto-Hamilton highway, there were built two miles of concrete pavement with a bituminous carpet coat. The bituminous application was intended to afford greater resiliency and a better tractive surface for horse traffic, but it has been found difficult in this case to secure a satisfactory bond between the

concrete and the bitumen, apparently due to the continuously moist condition of the concrete, caused by the heavy clay subgrade and the proximity of the road to the lake. The concrete is 15 feet wide, 7 inches thick and was originally surfaced with an application of one-third gallon of bitumen per square yard, the whole covered with granite chips. The cost of this road was approximately $15,000 per mile, including tile-draining, grading, and a five-foot earth shoulder.

Short sections of brick pavement have been constructed on a number of hills subjected to heavy teaming. These include a 9-inch concrete base with a 6-inch curb and sand cushion on which the bricks are laid. Paving brick of the best quality must be imported from the United States, and the high freight charges and consequent excessive cost of the finished pavement, which is from $2.25 to $3.00 per square yard, render its use on country roads, except in special cases, out of the question.

A section of tar-macadam has been laid in Stouffville Village. The foundation was an old gravel road and required the addition of only a small quantity of stone, averaging 5½ inches in depth, to give a proper crown. The stone was laid 15 feet wide and rolled, and heated tar applied, in quantity equivalent to

Broken Stone Road in Middlesex County.

Township of Adelaide.

1¼ gallon per square yard. With a low freight rate on stone, and comparatively cheap labour, this work was done at the moderate cost of 66 cents per square yard.

The high standard of construction required in York County, and the comparatively high cost of material combine to make the cost of these roads higher than in most other localities in Ontario. Many of the roads have been built by contract at a cost of from $5,000 to $8,000 per mile, including ordinary grading, depending largely on the width of metal used. With an efficient organization, the county has been able, by day work, to build roads to a corresponding standard at a cost of from $3,500 to $6,000 per mile.

Naturally, roads subjected to such heavy traffic demand constant and careful maintenance. The majority of the completed county roads are now systematically treated with oil or tar. Oil containing 45 per cent. asphalt has been applied at the rate of one-quarter gallon per yard over a width of 16 feet, and covered with a light coat of sand, at a total cost of $138 per mile per application. A single application has been found to give satisfactory results for nearly an entire season. On other roads refined tar of the grade known as Tarvia B has been applied at the rate of one-quarter gallon per square yard and covered with sand at a cost of $252

per mile. This treatment has given the desired results for an entire season, and the cost of keeping the road surface in equally good condition for a second season should be considerably less.

A number of substantial concrete bridges with spans varying from 14 feet to 70 feet have been erected, chief of which are a 35-foot beam span with open railing on the Kennedy Road, a 65-foot open spandrel arch at the Village of Kleinburg, and a 70-foot concrete truss near Unionville. These bridges have all been designed with a view to appearance as well as serviceability. Particular attention was paid to the finished surface, which, together with their artistic design, has provided a number of structures of pleasing appearance. The extra expense involved in this regard for the aesthetic is negligible when considering the probable life of these bridges and their relation to the surrounding scenery.

The machinery owned by the county includes four steam rollers, one gasoline roller, one scarifier, two graders, five water wagons and small implements.

The total expenditure under the Highway Improvement Act to the end of 1914 has been: Road construction, $429,628.11; bridges, $17,553.62; machinery, $18,714.91; superintendence, $13,174.43. Total, $479,071.07.

The work since its organization has been under the direction of a joint commission composed of members appointed by the county council and the City of Toronto. Construction has been under the supervision of Mr. E. A. James, C.E., Toronto.

STEAM DRILL
In Welland County Quarry.

Appendix B.

TESTING OF MATERIALS.

W. A. McLean, Esq., C.E.,

Chief Engineer of Highways,

Ontario.

Sir,—I have the honour to submit herewith a report on the laboratory work performed by this Department since October, 1914, in connection with the testing of materials for road construction and investigations conducted into the use of special materials.

The apparatus available consisted of the following:

1 200,000 Pound Riehlé Bros. Power Driven Testing Machine.
1 100,000 Pound Riehlé Bros. Power Driven Testing Machine.
1 20,000 Pound Riehlé Bros. Power Driven Testing Machine.
1 Deval Abrasion Machine for determining the wearing qualities of rocks.
1 Impact machine for determining the toughness of rocks.
1 Impact machine for determining the cementing value of rock powders.
1 Ball mill.
1 Briquette forming machine and mould.
1 Diamond core drill.
1 Diamond saw.
1 Grinding lap.
1 Howard and Morse power-driven sifter with screens.
1 Small jaw crusher.
1 Drying oven.
1 Fairbanks shot machine for cement testing.
1 Riehlé Bros. shot machine for cement testing.

Moulds for concrete cubes, cylinders, beams and cement briquettes; heavy and light scales, chemical balances, glassware, and sundry apparatus used in connection with the above.

Tests on Stone.

Owing to the non-uniformity of rock, particularly between the beds, it is necessary that the sampling be done with care and intelligence. As the results obtained from laboratory tests show the qualities of the sample only; unless the sample represents the material in the deposit, the results of the tests are of little practical value. Even when the greatest care is taken to get a representative sample, tests made on samples from the same deposit, taken at different times, will not agree. It is evident, therefore, that not only must great care be exercised in the taking of samples but a systematic method of sampling must be adopted and used throughout.

A general examination is first made of the quarry and notes taken as to location, acreage, class of material, form of bedding, direction of dip, depth of overburden, and whatever information is desirable from the geological standpoint. Note

is also made of the equipment of the quarry, if any, shipping facilities, and an endeavour made to ascertain the cost of producing crushed stone in the bins. If the material has been used for road construction, the location of such roads, date of building, and the name of the person in charge of them is obtained.

If the face of the quarry contains beds of shale or weathered rock, inquiry is made to ascertain whether this material is crushed and shipped with the harder stone. If so, it is included in the sample, and if not, it is neglected. A point is then chosen where the various beds exist in the same proportion as would represent

Face of Gravel Pit in Oxford County.

an average of the whole face. Commencing at the top layer small portions are broken off each bed in succession, avoiding weathered material. These pieces are about the size of commercial 2-inch stone. Several larger pieces approximately 4 x 4 x 2 inches are taken for the toughness test. In all, the sample should not weigh less than thirty-five pounds and not more than forty-five pounds. In the case of a shallow face, if the desired amount is not obtained by the time the bottom bed has been reached, the operation is repeated at another point which is suitable from the standpoint of the proper distribution of the material.

The sample is shipped in a heavy sack with a tag bearing the sample number. Under this number the information pertaining to the deposit is entered in the office records.

Abrasion Test.

This test is made to determine to what extent the material will withstand the wearing action of traffic. As close to fifty pieces of the stone as possible, of approximately the same size are broken and dried. When dry they should total in weight within 10 grams of 5 kilograms. They are then placed in one of the cylinders of the abrasion machine. These cylinders are of cast iron with an inside diameter of 20 centimeters and a depth of 34 centimeters. They are held in a framework in a position making an angle of 30 degrees with the horizontal. The test consists of 10,000 revolutions of the cylinder at a rate of from 30 to 33 per minute. After the test the material is removed from the cylinder and washed, all that passing a 1/16 inch screen being considered lost by wear. After drying, the sample is weighed. The loss in weight is expressed directly as the per cent. of the original weight, or as the French Coefficient of Wear which is,

$$\frac{40}{\text{per cent. of wear.}}$$

During the test the pieces of stone are not only subjected to a grinding action between themselves as well as against the walls of the cylinder but, owing to the inclination of the axis of the cylinder they are thrown from end to end twice during each revolution, subjecting them to impact. Thus the abrasion test not only indicates the hardness but also the toughness of the material.

Cementation Test.

This test is made to determine the binding qualities of the rock powder when wet. It has a very important bearing on the choice of a rock for use in waterbound macadam roads, as upon it depends the smoothness of the road and the holding of the individual pieces of the stone on the surface in place. A rock, otherwise good, but lacking in this property, would soon ravel and rut under traffic unless held together by some other material, while one with a high binding quality will stand up under motor traffic for an extended time.

In order to determine the cementing value of rock powder, the smaller pieces remaining after the pieces for the abrasion test have been picked out are crushed to pass a ½-inch screen; 500 grams of this is placed in the ball mill with 90 c.c. of water and two 20-lb. cast iron shot. The mill is then turned for 5,000 revolutions at a rate of from 30 to 33 per minute. The resulting material, resembling moist clay, is then moulded into briquettes 25 m.m. in diameter and 25 m.m. long in the briquette moulding machine. Eight briquettes are made for testing and two for the slaking test.

After drying for twenty hours in air, the briquettes are baked for four hours at a temperature of 212 degrees Fahrenheit, and then removed to a dessicator for twenty minutes where they are cooled to room temperature, free from moisture.

They are then tested on the impact machine for determining cementing value. Eight briquettes are tested and the average of the five showing the most consistent results are recorded as the cementing value of the material.

Toughness Test.

This test is made to determine to what extent the rock will resist impact, which in the road is caused chiefly by the feet of horses. A core 25 m.m. in diameter is drilled from each of the large pieces of stone in the sample; cut with the diamond saw to approximately 25 m.m. in length; and ground on the grinding lap with emery powder to the correct length of 25 m.m., taking care that the ends are parallel and perpendicular to the axis of the core. It is then tested in the impact machine for determining toughness. The average of all the cores tested is recorded as the toughness of the material.

Specific Gravity and Weight per cubic foot.

A small piece of rock weighing in the neighborhood of fifty grams is weighed accurately in air. It is then suspended by a fine copper wire, previously weighed, and weighed immediately on immersion in water. From this the specific gravity is calculated by the formula,

$$\text{S. G.} = \frac{W1}{W1 - W2}$$

Where W1 is the weight in air, in grams,

W2 is the net weight in water, immediately after immersion, in grams.

The weight of the solid rock per cubic foot is found by multiplying the specific gravity by the weight of a cubic foot of water at 32 degrees Fahrenheit (62.48 lbs.).

Absorption Test.

The test is made to determine to what extent the rock will absorb water. This has an important bearing on the service the material will give in the road, as a highly absorptive rock is more readily shattered by frost than one impervious to moisture.

The specimens used for the specific gravity test are immersed in water for four days, during which time they attain constant weight. They are then weighed in water and this weight along with those previously taken provide data for computing the absorption, which is obtained from the formula,

$$\text{Absorption in pounds per cubic foot} = \frac{W3 - W2}{W1 - W2} \times 62.48,$$

where W3 is the weight after four days' immersion.

There have been to date thirty-two samples of rock tested. Of these a number were sent in by the Dominion Geological Survey from the north shore of Lake Superior, Lake Huron and the islands in Lake Huron. A number of samples were taken by the writer, and a number of samples sent in by owners of quarries, were tested by the Toronto-Hamilton Highway Commission. The calculations in connection with the latter were checked by the writer and tests not required by the Commission were made in order that the records might be complete. In the neighbourhood of five samples were tested in this way.

Results of Tests on Samples of Rock.

Lab. No.	District or County.	Township or Locality.	Wt. per cu. ft.	Abs. per cu. ft.	Per cent. Wear.	French Co-eff.	Tough-ness.	Cem. Value.
1-1	Algoma	Blind R.....	184.5	.....	2.80	14.28	18.0	24*
1-2	"	Shoepack Bay.....	181.0	0.191	3.80	11.50	23.0	62*
1-3	"	Thessalon R.	181.5	0.001	.....	.....	10.0	17*
9-1	Essex	Livingstone Chann'l	164.6	1.840	5.87	6.80	3.5	15†
13-1	Grey	Sydenham	171.5	1.37	2.80	14.80	13.0	62†
13-2	"	Near Owen Sound .	170.0	0.71	.....	.....	6.0	38†
14-1	Haldimand .	Walpole	166.0	0.76	5.88	6.80	15.0	48†
14-2	"	"	167.0	0.699	4.90	8.16	7.5	22†
14-3	"	"	167.2	0.074	6.24	6.7	9.0	34†
17-1	Hastings....	Huntington	168.4	0.113	6.30	6.35	.....	20†
17-2	"	Thurlow.....	169.0	0.102	4.26	9.39	5.3	21†
17-3	"	Huntington	168.0	0.304	5.00	8.00	5.3	†
34-1	Peel.....	Toronto	166.5	1.13	5.70	7.00	20.0	48†
36-1	Peterboro' ..	Belmont	191.0	0.01	2.30	17.10	22.0	37*
41-1	Simcoe	Orillia.....	164.0	0.167	8.29	4.82	7.0	37†
41-2	"	"	164.0	0.212	5.27	7.60	7.0	24†
41-3	"	"	.....	.....	6.25	6.40	6.0	30†
46-1	Victoria	Eldon	168.0	0.106	5.10	7.80	7.0	†
48-1	Welland	Humberstone.....	167.0	0.106	11.70	3.42	6.0	50†
48-2	"	Bertie	166.0	0.140	9.55	4.18	15.0	101†
49-1	Wellington..	Guelph	167.0	0.023	4.70	8.50	6.0	16†
49-2	"	Near Guelph City..	.....	.....	5.13	7.80	.....	21†
50-1	Wentworth .	Saltfleet.....	168.4	0.530	5.41	7.39	11.0	46†
50-2	"	Ancaster	168.5	1.000	4.04	9.90	10.0	24†
50-3	"	Saltfleet.....	174.5	0.760	5.10	7.80	9.0	19†
50-4	"	Flamboro' W.....	172.0	0.680	3.80	10.50	11.30	21†
50-5	"	Barton	172.0	0.475	7.60	5.6	6.5	28†
52-1	L. Huron ...	Green Island.....	183.4	0.490	4.37	9.2	19.0	40*
52-2	" ...	Frechette Island ..	171.5	0.077	3.30	12.0	15.0	67*
52-3	" ...	Scott Island..	185.5	0.093	2.12	18.9	22.0	66*
52-4	" ...	High Island.....	184.0	0.081	2.50	16.0	23.0	72*
53-1	L. Erie	Pelee Island	163.5	0.637	.....	.....	4.5	13†
....	State of Vermont..	.....	167.0	0.099	5.40	7.4	8.0	30 (granite)

Note.—Samples designated by "*" are traps.
" " " "†" are limestones and dolomites.

Tests on Gravel.

Unlike the tests on rock, there have been no methods of testing gravel adopted universally. In some laboratories more stress is laid on the grading of the material than on any other property, while in others cementation tests are made on the material as received and on the coarse and fine aggregates.

After a consideration of the various tests available, it was decided to conduct the following tests on gravel to be used for gravel road construction:—

Abrasion test on material retained by the one-half inch screen.

Cementation test on material retained by the one-quarter inch screen and passing the one-half inch screen .

Cementation test on material passing the one-quarter inch screen.

Granulometric analysis to determine percentage of material passing one-quarter inch screen, using 1/8-inch 10, 20, 30, 40, 50, 100, and 200 mesh screens.

Determination of silt and clay.

Determination of tendency of cemented powder to slake when under the action of water.

Abrasion Test.

This test is similar to the abrasion test on rock, except that the particles in the test are of all sizes instead of approximately one size. The results of the test show to what extent the larger particles will resist the grinding action of traffic. Owing to the presence of small particles, there is not the same force of impact as is the case with the test on stone, and as the particles have a smoother surface, the wear is less than in the case of stone; consequently the tests on gravel and stone are not directly comparable.

Cementation Tests.

When a road is constructed of gravel, the material is bound together by the small particles of broken pebbles, sand and clay. This may differ, and in fact always does differ from the powder produced under the action of traffic. Consequently there are two distinct binding actions take place. While the determination of the percentage of clay present will furnish valuable information, it does not show to what extent the initial bond will be formed nor how it will behave under the action of water. If a cementation test were made on the material as received the results might be misleading as the binding action of the clay would affect that of the rock powder.

A gravel that binds readily when first laid is not therefore a first-class material, and for the same reason a gravel that does not bind quickly may prove in the end to be the most suitable to use.

By determining the cementing value of the fine and coarse materials separately, an idea is obtained of what may be expected not only when the road is first constructed but also after it has been under traffic for some time. For this reason it was decided to make cementation tests on the material retained by the one-quarter inch screen and passing the one-half inch screen as well as on the material passing the one-quarter inch screen.

Granulometric Analysis.

In addition to determining the percentage of the whole sample which passes the one-half inch and one-quarter inch screens, a determination is made of the percentage of the fine aggregate which passes the finer screens. This is of value for two reasons. In the first place a material in which all sizes of pebbles are present will compact more closely, the smaller particles filling the voids between the larger. The more stone that is present in a given space, the more dense the mass, hence the best gravels have all sizes of pebbles present. It would be desirable to determine the amount of material passing the 2-inch, 1½-inch, 1-inch and three-quarter inch screens, but the laboratory equipment at the present time does not permit of this being done.

The sieve analysis of the fine aggregate is of value in showing the percentage of fine material present. It may be considered that the material passing the 50-mesh screen is of the nature of quicksand and is undesirable, while a greater percentage of material passing the one-quarter inch screen than fifty per cent. causes the gravel to be too fine. Hence the larger proportion of very fine material, the more may the efficiency of the material be said to be impaired.

The granulometric analysis is made by drying a part of the well-mixed fine aggregate and placing 500 grams of this on the 1/8 inch screen. The finer screens are attached in their proper order under the 1/8 inch screen and the stack is given a circular reciprocating motion, at the same time being jolted vertically. The shaking continues for exactly ten minutes. It is important that the time be closely

watched as a small variation in the length of time will alter the results. The weight on each screen is accurately determined and expressed as a percentage of the total weight.

Slaking Test.

This test is made to determine the effect of the action of water on the dry rock powder. It shows to what extent the road will puddle during wet weather. While a high clay content would indicate that the material would do this, a material carrying a high percentage of lime which readily takes up its water of crystallization would be expected to slake, just as quick lime slakes under the action of water. This was illustrated in the case of a gravel in which the briquettes made at the same time and in the same manner as those for the cementation test disintegrated in a short time when immersed in water. The silt analysis showed a clay and silt content of 13.5 per cent. This would indicate that the high percentage of clay and silt was the cause of the disintegration. The material when used on roads puddles very quickly under rain. On the other hand a gravel containing only one per cent. of clay and silt when subjected to this test gave the same results. There must therefore be other reasons than a high percentage of clay to cause the material to slake. As will be seen from the tabulated results of tests the number of gravels showing this tendency is very small. Whether it is a reliable indication of what may be expected in actual service has not yet been decided.

In connection with the sampling of the gravel deposits, the same methods were used as with stone. In addition to the notes taken, photographs of the face are usually taken, which show not only the appearance of the material in the pit but are of value for reference with regard to method of bedding, extent of sand sills and amount of large boulders.

There have been twenty-one samples of gravel tested to date.

Granulometric Analyses of Gravels Tested.

Lab. No.	Per cent. of total passing.			Percentage of fine aggregate passing.						
	½ inch.	¼ inch.	⅛ inch.	10	20	30	40	50	100	200 Mesh.
9–2	.....	92.5	.....	75.0	49.4	39.5	24.7	15.0	4.3	2.8
9–3	.....	82.3	85.0	79.0	62.7	49.5	35.7	19.5	4.1	2.5
9–4	.....	30.0	.....	73.4	52.6	38.1	27.3	16.5	4.2	2.4
16–1	.....	75.0	34.0	19.6	5.5	2.8	2.7	2.6	2.5	2.5
16–2	Material was closely cemented, making sieve analysis impossible.									
19–1	.....	52.5	88.0	71.4	56.5	39.5	20.8	9.2	2.4	1.0
19–2	.....	56.9	75.4	65.6	42.8	30.8	22.8	16.0	5.2	3.4
19–3	.....	40.0	59.3	46.8	25.3	17.7	13.0	8.7	4.2	3.0
19–5	89.0	80.0	89.0	83.2	63.0	47.6	38.4	31.0	7.6	2.6
26–1	72.2	51.0	68.0	50.2	33.2	18.0	15.4	13.4	10.0	7.6
26–2	.....	43.0	81.0	73.5	45.2	23.2	12.2	6.0	2.2	1.2
26–3	.....	34.3	83.0	78.0	66.2	53.0	38.0	25.6	11.2	9.6
26–4	77.0	63.5	84.4	80.6	42.2	22.0	14.8	10.6	5.2	3.4
26–5	55.5	41.2	80.1	73.8	57.0	36.6	20.8	11.0	3.8	1.8
26–6	76.2	62.5	79.6	73.0	60.8	46.8	28.8	14.4	4.0	2.6
29–1	81.0	70.2	91.0	87.4	78.0	56.6	31.4	15.2	3.2	1.2
30–1	.....	39.7	74.0	67.1	50.5	38.7	29.3	21.0	8.0	3.4
30–2	.....	39.5	80.4	71.5	34.7	13.5	8.9	7.4	6.0	4.8
34–2	.....	51.8	.....	51.6	29.1	16.3	9.3	4.9	2.4	2.0
49.3	.....	50.0	72.0	58.0	24.1	11.4	5.6	2.0	0.6	0.5
50–6	.....	68.0	61.0	42.0	31.5	23.5	15.3	6.7	1.8	1.4

Note.—Where no values are given as passing the ½-inch screen, this indicates that the tests were made before this quantity was determined as part of the granulometric analysis.

Results of Tests on Samples of Gravel.

Lab. No.	County.	Township.	Per cent. wear.	Cementing value.		Per cent. silt.	Minutes to slake.	
				Coarse.	Fine.		Coarse.	Fine.
9–2	Essex	Sandwich, E.....	.....	86	40	1.50	*	*
9–3	"	" W.....	.....	32	15	1.00	20	20
9–4	"	Gosfield, S.	6.60	.....	115	4.50	*	*
16–1	Halton	Nelson	7.45	31	89	0.50	5	†
16–2	"	Trafalgar	.....	.....	62	3.00	*	*
19–1	Kent	Orford	3.54	75	88	2.00	*	*
19–2	"	Raleigh.....	4.80	37	39	5.50	*	*
19–3	"	Howard	3.07	70	70	4.50	†	†
19–5	"	Harwich.....	8.40	.....	132	5.30	†	†
26–1	Middlesex ..	Westminster.....	4.94	45	41	13.50	25	†
26–2	"	London	3.56	46	43	1.00	†	†
26–3	"	W. Nissouri.....	5.50	47	64	8.00	†	†
26–4	"	"	6.20	46	63	6.00	†	†
26–5	"	Lobo	6.34	53	68	3.50	†	†
26–6	"	Delaware	4.60	45	61	2.75	†	†
29–1	Norfolk	Woodhouse.....	3.42	57	70	1.10	†	†
30–1	Northumberland.....	Hamilton	2.2	.....	34	4.15	†	†
30–2	"	Murray.....	2.73	42	66	4.50	†	†
34–1	Peel.....	Toronto	2.48	113	117	2.80	†	†
49–3	Wellington..	Guelph	.....	34	32	0.50	†	†
50–6	Wentworth .	Flamboro, E.....	3.65	31	72	2.25	5	15

Note—Where "†" is shewn in the last two columns this indicates that the briquettes showed no signs of slaking after 96 hours. Where marked "*" this indicates that the test had not been adopted when these samples were tested.

Upon the completion of the tests the results obtained are entered on a card file. Those for gravel have not yet been printed, as it may be necessary to alter the tests as the work proceeds.

In addition to the results of laboratory tests on stone, the information relating to the quarry is also recorded. On the reverse side of the card is space for the results of the microscopic determinations, with any special remarks applying to the material.

When a quarry is visited, a list of the roads built of the material is obtained and the names of the parties in charge of them. On the Road Report cards, this information is entered and, if possible, a visit is paid to them. The date of construction, methods, traffic conditions, and as far as possible the yearly maintenance cost is also obtained. As inspection trips are made from time to time, it would be desirable to have these roads inspected and report cards filled out accordingly. In this way it will be possible to get a comprehensive idea as to the behaviour of the various materials on the road, information which, combined with laboratory test results, will prove of value.

The cards are cross indexed, being located either by laboratory number of the sample or by the county. The road report cards bear the sample number and are filled with the other card. It is proposed to use the same road report cards for gravel. The cards bearing the results of tests on gravel will be of a different colour so that they may be readily located in the file.

In connection with the tests on stone and gravel certain investigations were carried out from time to time with a view to determining the factors affecting the results. Owing to the great uniformity of the materials, sufficient data has not been obtained to justify any definite conclusions.

Tests on Concrete from the Sarnia Road.

Two blocks were submitted, measuring approximately 10 in. x 14 in. x 5 in. They were moulded from the material as it came from the mixer, one containing 4.44 per cent. hydrated lime. This percentage is expressed as a percentage, by weight, of the cement.

The aggregate used was river gravel from the bottom of the St. Clair River. the proportions of the concrete being 1:4.

As the blocks were too large for the testing machine and the cost of sawing them would have been prohibitive, they were broken in the 100-ton testing machine in the following manner:—

Grooves were cut around the blocks with a cold chisel, in both directions, dividing the block into four equal blocks. They were then supported, close to their outer edges, on inverted wedges and pressure through a sharp edge applied along the middle groove, until the blocks broke. Owing to the grooves, the fractures were approximately straight and the small blocks thus obtained were faced off with the chisel to as near smooth faces as possible.

The blocks were covered with neat cement and allowed to stand for ten days to harden. They were then submitted to compression on the 100-ton testing machine and the load increased gradually until failure occurred. The total load at this point was divided by the area in square inches and the unit load obtained which is given below:—

No.	Plain Concrete.	Concrete with 4.44 per cent. lime.
1	5,000 lbs. per sq. inch	4,000 lbs. per sq inch
2	5,060 " "	5,200 " "
3	3,500 " "	.....
Average	4,320 " "	4,600 " "

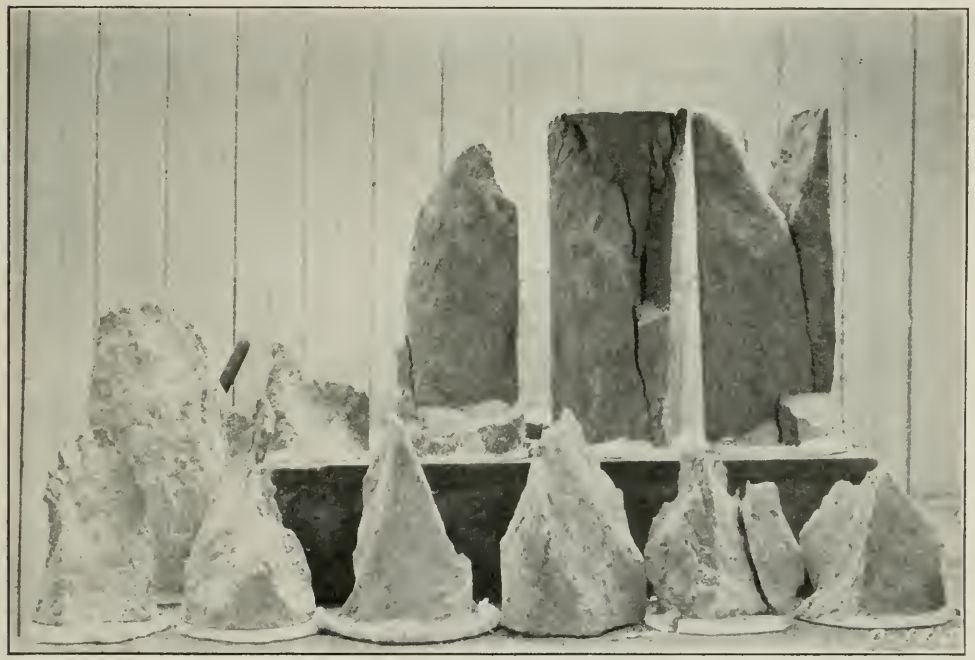
Only two blocks were available for test, from the large block containing hydrated lime.

The above results show a greater compressive strength for the material containing the lime, if the average of the three tests on the plain concrete is taken. One result is, however, so far below the others that it is a question if it should be considered. If it is not taken into account, the average of the two remaining values is 5,030 pounds per square inch.

HYDRATED LIME IN CONCRETE PAVEMENTS.

That the addition of hydrated lime to concrete results in an increase in the waterproofing properties of the material has been recognized for a number of years. The problem of rendering the walls of concrete tanks, reservoirs and foundations has been solved in many cases by the use of this material.

Laboratory tests have shown that concrete containing hydrated lime not only becomes impermeable but that none of the desirable properties are sacrificed. On the contrary, increases in tensile and compressive strength have been recorded along with greater facility in trowelling and surfacing. Ordinary sand mortar does not lend itself to the obtaining of a smooth finished surface. When such is required a coating of neat cement or fine sand mortar, a cement wash, or handrubbing with



Mortar Cylinders after Failure in Compression Test, Showing Uniformity of Material and Cones Formed on Failure.

abrasive blocks is usually resorted to. The lime appears to act after the nature of a flux, rendering the mortar smooth and plastic and making it possible to work up to a fine surface. The formation of surface cracks is lessened by the addition of lime, which indicates that it reduces the co-efficient of expansion of the material, due to change in temperature and moisture content, or causes it to be uniform throughout the mass.

While the chemical reactions taking place during the hardening of concrete are not fully understood it is thought that the lime takes no part in them but acts solely as a void filler, making the concrete more dense and therefore stronger and less permeable. An examination of a piece of concrete mortar will show a certain percentage of fine voids. These are more pronounced where the mortar has been in contact with a piece of the coarse aggregate. By the aid of a microscope of even moderate power smaller voids may be seen throughout the

mortar generally. If the material is subjected to the action of water it is to be expected that these voids will become filled. The resulting action on the concrete when the frost reaches these small, water-filled cavities will, to say the least, be deleterious. In warm weather when the danger from frost is not present the water may contain salts or other materials in solution which will have a disintegrating action. Thus, in all seasons the mass is exposed to danger of so long as these capillary chambers exist.

It is, therefore, essential that the voids be filled, or reduced to a minimum. It is generally thought sufficient to have the material entering into the concrete so proportioned that the voids in the coarse aggregate are completely filled by the mortar, those in the fine aggregate being filled with cement, with a slight excess of the latter. Concrete so proportioned, properly wetted, mixed and tamped, is considered dense. Simple tests will show that no amount of mixing or tamping, or even the addition of an excess of cement will entirely eliminate the small voids. So long as they exist the mass will be subject to expansion and contraction to a greater degree than if they were filled with material. This is the purpose that is believed to be served by the hydrated lime. The results of tests in actual conditions as well as those made in the laboratory show that there is a decrease in the contraction of the material, that it is more impervious to water, and that with certain percentages of lime added there is a resulting increase in strength.

With these facts determined it was natural that favorable results should be expected from the use of hydrated lime in concrete pavements. When laid in this form, concrete is subjected to what is perhaps its most severe test. In addition to being under static and live loads, it is exposed to extreme climatic conditions. The temperature in the southern portion of Ontario commonly ranges from 95 degrees in summer to 20 degrees below zero during short periods in the winter months. In addition the snow lies on the ground for at least three months of the year, attaining a depth of from 12 to 24 inches on the level. The average frost line is about three feet below the surface of the ground. When together with these conditions it is remembered that concrete in a pavement has a greater area of surface exposed, per cubic yard of material, than in any other class of work, the necessity of obtaining a thoroughly dense material with the minimum co-efficient of expansion, is realized.

These desirable properties are being striven for by a number of engineers directly interested in the laying of concrete roads. While laboratory tests are of great value in indicating the qualities of and proportions of the materials to be used, no test other than that of actual service will furnish conclusively convincing results.

In order that effect of hydrated lime on concrete pavements might be observed under actual conditions the Office of Public Roads and Highways of the Province of Ontario, in 1912, built a section of pavement near Windsor, where desirable materials could be obtained and results could be observed and compared with those of similar pavements, without lime, laid by the city. The section built is on Tecumseh Road, a principal market road, which is the westerly terminus of the old trunk road between Windsor and Montreal. The concrete is sixteen feet wide and 7 inches thick, with broken stone shoulders 18 inches wide and blind stone drains from the bottom of these shoulders to the open gutters. Tile drains were laid on one side only as the other was served by a wide, open ditch. The aggregate used was a clean river gravel, mixed with the cement in the proportions of 1:4. Where the lime was used it was previously mixed with the cement and

rebagged. The lime replaced eight per cent. of the cement, measured by volume. It was of the dolomitic variety, being obtained from the Central Farm at Guelph.

Unfortunately the road did not get fair treatment as excavations were made directly under the shoulders for the installation of water mains and sewers. At the present time, however, although both the section containing the lime and that without it are cracked, for the reason above stated, the former is in the better condition, the surface being smoother and the cracks fewer.

In the summer of 1913 a section of concrete road containing hydrated lime was laid by the Office of Public Roads and Highways near Sarnia, Ont. The road is 5,946 feet long, sixteen feet wide and seven inches thick, one course construction being used. Gravel shoulders four feet wide, bound with limestone screenings, were laid on the sides. Expansion joints filled with paving pitch were placed at thirty-foot intervals. The gravel used, was supplied from the St. Clair River at Point Edward.

The hydrated lime, which replaced ten per cent. of the cement by volume, was mixed with the cement in a small gasoline driven mixer and rebagged. The cost of this was $0.084 per square yard of pavement laid. One carload of cement was thus handled per working day. At the present time this pavement is in first-class condition, showing but a few cracks, in spite of the fact that tons of heavy machinery were hauled over it in connection with building operations on adjoining property.

The writer conducted a preliminary set of laboratory investigations with a view to determining, if possible, the factors affecting the use of hydrated lime in Portland Cement mortars.

Tests were made to determine the following properties:—Tensile strength, compressive strength, rigidity, toughness and resistance to wear.

A fine, clean, pit sand was chosen, the fineness being considered advisable, tending towards consistent results. The Granulometric analysis gave the following:—

Screen	No. 10	No. 20	No. 30	No. 40	No. 50	No. 100	No. 200
Per cent. passing	98.9	92.3	46.9	21.7	21.7	2.0	.4

Silt present, 0.2 per cent.

The Portland cement was of average grade and had the following properties:—

Specific gravity, 3.15.
Per cent. retained, No. 100 screen, 5.3; No. 200 screen, 19.2.
Initial set, 1 hour 30 minutes.
Final set, between 4 and 5 hours.
Acceleration test showed no checking or cracking..
Strength of neat cement at 24 hours, 240 lbs. per sq. inch.
" " " 7 days, 525 " "
" 1-3 mortar of standard Ottawa sand at 7 days, 200 lbs. per sq. inch.

The hydrated lime used was obtained from the Provincial Prison Farm at Guelph, Ont., and has the following analysis:—

Magnesia (MgO) 33.1 per cent.
Calcium Oxide (CaO) 43.5 per cent.
Silica, alumina, etc., 23.4 per cent.
Class of lime, Dolomitic.

The mortars used, with the proportions of lime added were:—

Series.	Mortar.	Per cent. Lime.	Series.	Mortar.	Per cent. Lime.
A-1	1-2	0	B-1	1-4	0
A-2	"	4	B-2	"	8
A-3	"	7	B-3	"	15
A-4	"	10	B-4	"	25

The weight of lime is based on the weight of cement, both dry, and is added to it, not replacing it.

The dry cement and lime were screened together twice and turned over three times. The water was then added and the mass turned six times with the shovel. The consistency in each case was standard throughout the tests, the mixture being on the wet side, although not sloppy.

In placing in the moulds care was taken that each specimen received the same amount of tamping and packing. The chances for error due to variations in this operation were reduced to a minimum.

At the end of twenty-four hours the moulds were removed and the material dried in air for thirty-six hours, when it was immersed in water, being completely covered. Any loss due to evaporation of the water was made up from time to time.

The tests for tensile strength were made on standard cement briquettes, with a Reihle shot machine. Twelve briquettes were tested and the average of those giving the most consistent results recorded.

The tests for compressive strength and rigidity, or modulus of elasticity in compression, were made at the same time. The cylinders, measuring 8 x 18 inches, first being capped with plaster of paris, were placed on an adjustable block on the testing machine. A metal plate was set on the top and the head lowered slowly. The adjustable blocks were set so that the top plate was parallel with the head in order that the pressure would be evenly distributed over the surfaces.

The reduction in length was determined by means of a compressometer with 12-inch centres. The micrometer screws read to .00001 inches and were fitted with electric contacts, providing a very accurate adjustment. The reading for no load being taken, the load was applied and the compressometer readings taken. Sufficient readings were taken to give from twelve to fifteen points on the Stress-strain curve. The type of clamps used with the compressometer were such that it was possible to leave the instrument on the cylinder throughout the test for compressive strength, that is, until the cylinder failed.

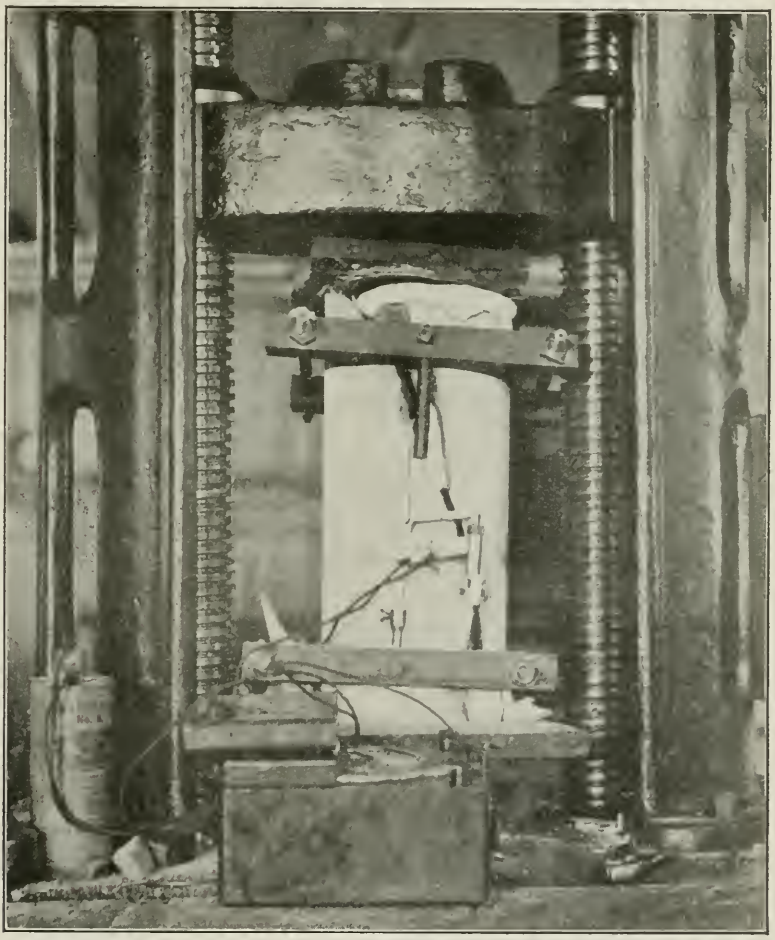
The testing machines used were the Riehle 100-ton, vertical machine and the Riehle 50-ton, vertical machine. The cylinders from series "A" were tested on the former as their strength exceeded the capacity of the smaller machine. Series "B" were all tested on the 50-ton machine. Both machines were adjusted before the commencement of each test.

The methods of attaching the compressometer and applying the load are shown in the accompanying photograph. All the cylinders of series "A" failed suddenly with a loud report, while those of series "B" failed slowly with a "crunch," usually after the load had been constant for some seconds. In several cases it was impossible to get a definite reading at the point of failure on series "B" as the fatiguing of the material caused a continuous change of length until failure took place.

In series "A" the point of failure came in every case with an increase in load, indicating that the 1:2 mortar withstood fatigue longer than the 1:1 mortar.

The tendency to produce cones was shown, in every case with series "A" and in several cases with series "B," these latter not being so well formed. The forms that the cones took together, with one cone still in position, is shown.

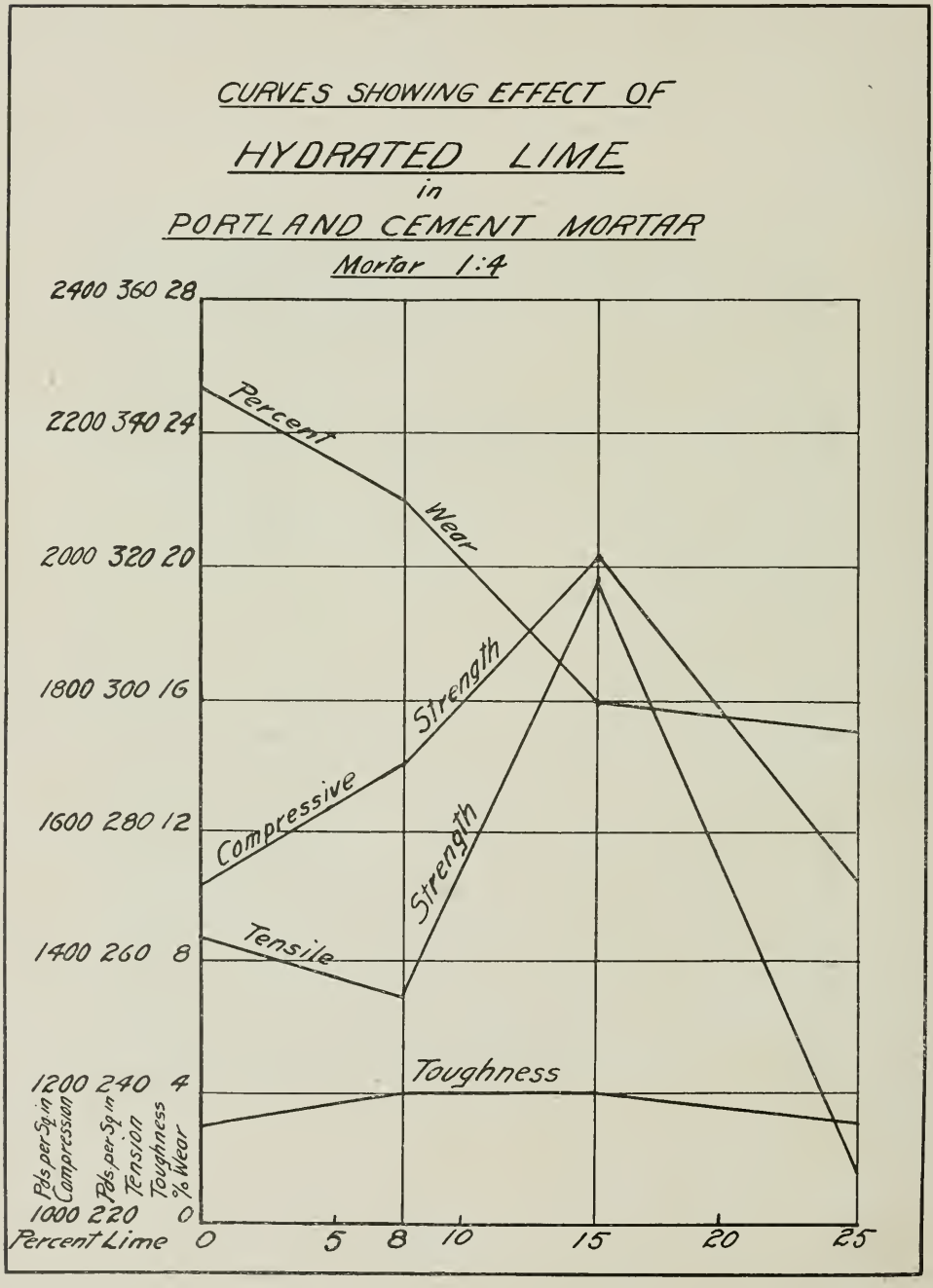
The compressive strength was calculated by dividing a load in pounds on the cylinder at failure by the area in square inches. This gives the compressive strength (ultimate) in pounds per square inch.



COMPRESSION TEST SPECIMEN IN TESTING MACHINE, SHOWING METHOD OF ATTACHING COMPRESSOMETER.

The points on stress-strain curves were calculated and plotted in the following manner:

For a given load in pounds per square inch, the average difference in the compressometer readings was reduced to strain (change of length in inches, per inch of length). With strain as ordinate and stress as abscissa the curves were plotted. As the Modulus of Elasticity in Compression (Ec) depends on the inclination of the curve with the axis of stress, a constant "Ec" is indicated by a straight line


CURVES SHOWING EFFECT OF
HYDRATED LIME
in
PORTLAND CEMENT MORTAR
Mortar 1:4
2400 360 28
2200 340 24
2000 320 20
1800 300 16
1600 280 12
1400 260 8
1200 240 4
1000 220 0
Percent
Wear
Strength
Compressive
Strength
Tensile
Toughness
Lbs per Sq in Compression
Lbs per Sq in Tension
Toughness
% Wear
Percent Lime 0 5 8 10 15 20 25

curve. Hence from the origin to the point where the curve ceases to be straight the Ec remains constant, and is determined by dividing the stress by the strain. Thus

Ec=C/S, where Ec is the Modulus of Elasticity for concrete.

C is the stress, and

S is the strain.

The quotient gives, what might be called the average Modulus of Elasticity, covering a range of stresses from zero to the point calculated. As stated before, where the curve has a constant inclination to the axis of stress a calculation for any point on the curve will give the same value.

The stress-strain curves were calculated for the test from which it was possible to get the greater number of readings near the upper portion of the curve. Two cylinders were tested for each mortar in order that a check might be had. In practically every case the test readings checked closely; consequently in order that the curves might be easily read, the one giving the most points was recorded.

The test for toughness was made on 1-inch cubes. These were tested on the Impact Machine for testing the toughness of rocks. The test consisted of repeated blows of the hammer, starting with a fall of 1 cm. and increasing by 1 cm. for each succeeding blow. The number of blows required to cause failure represents the toughness of the material. The average of two tests was recorded.

The test for resistance to abrasion was made in the Deval Abrasion machine. The pieces from the briquettes broken in the test for tensile strength were placed in the cylinder, after weighing, and given 6,000 revolutions at a rate of 33 per minute. They were then removed, carefully cleaned and weighed, the loss of weight by abrasion being expressed as a percentage of the original weight.

Series "A," Mortar 1:2.

Lab. No.	Per cent. Lime.	Tensile Strength.	Compressive Strength.	Per cent. Wear.	Toughness.
A-1.....	0	267.2	3,540	7.88	5
A-2.....	4	305.5	3,715	7.625	5
A-3.....	7	335.5	3,970	5.600	6
A-4.....	10	328.0	3,425	5.000	5

Series "B," Mortar 1:4.

Lab. No.	Per cent. Lime.	Tensile Strength.	Compressive Strength.	Per cent. Wear.	Toughness.
B-1.....	0	264	1,520	25.40	3
B-2.....	8	255	1,700	22.00	4
B-3.....	15	318	2,015	16.00	4
B-4.....	25	227	1,520	15.00	3

Series "A"

Values of "Ec" up to 1,200 lbs. per sq. inch.

A-1 .....3,337,500 lbs.
A-2 .....3,080,000 "
A-3 .....3,337,500 "
A-4 .....2,925,000 "

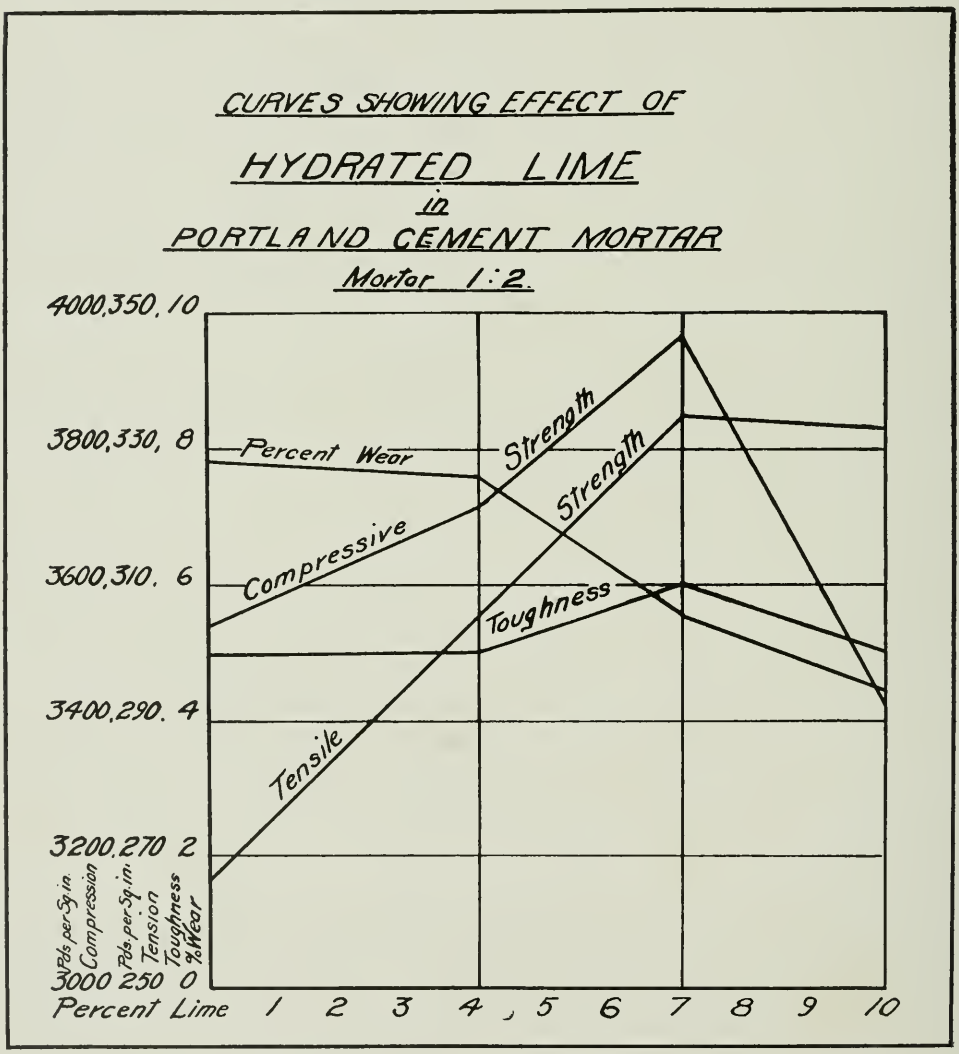
Series "B"

Average values of "Ec" up to 800 lbs. per sq. in.

B-1 .....2,650,000 lbs.
B-2 .....2,500,000 "
B-3 .....2,350,000 "
B-4 .....2,425,000 "

Observations.

With the addition of hydrated lime to the 1:2 mortars an increase of tensile strength was observed, reaching the maximum in a mortar containing seven per cent. lime. Beyond this point the tensile strength decreased. In the 1:4 mortars the maximum tensile strength was developed by that containing fifteen per cent. of lime, a falling off taking place when this was exceeded.



The same variation was noted in the compressive strength, a seven per cent. lime content giving the highest values with a 1:2 mortar and a fifteen per cent. lime content with the 1:4 mortars.

The observations and calculations for the Modulus of Elasticity for the 1:2 mortars did not give as definite variations as in the other tests. There was little variation in the mortars contained from 0 to 7 per cent. lime, a very slight decrease being recorded for the 4 per cent. lime content, the same value being

obtained with 7 per cent. as with 0 per cent. lime. With the 1:4 mixtures a smaller variation was found, but a slight decrease in the values, as the percentage of lime was increased. The decrease between 0 and 15 per cent. lime contents was slight.

An increase in toughness was found in the 1:2 mortars, reaching a maximum with that containing 7 per cent. lime and an increase, to maximum at 15 per cent., with the 1:4 mortars.

The percentage of wear decreased throughout both series with the increase of lime content. Contrary to the results obtained in the other tests the resistance to wear increases past the points at which the highest values were obtained for tensile strength, compressive strength, and toughness. The increase is, however, not so rapid beyond these points in either series.

Conclusions.

The results of the tests described above would indicate a certain marked advantage resulting from the addition of hydrated lime to Portland Cement mortars. As well as an increase in the various properties determined there is the additional advantage that the material is more easily handled when the finished surface is developed, trowelling being easier than when the lime is absent.

From a close observation it would appear that there was no decided chemical reaction between the lime and the other contents of the mixture. Apparently the lime acts as a void filler, giving a more dense mixture and increasing the sand carrying capacity of the cement. If a high calcium lime were used there might be a certain limited reaction between it and the silicates of the cement.

From a comparison of the results obtained by other experimenters and those obtained by the writer it would appear that the least percentage of lime that would give the best results will vary with the grading of the fine aggregate.

A study of the accompanying curves will show that the variations in the different properties bear a close relation to each other. This indicates that the material is generally benefited by the addition of the proper proportions of hydrated lime.

The above determinations can only be called of preliminary importance. They indicate the percentage of lime that gives, approximately, the best results. A further series of tests of mortars with lime contents of 6 per cent., 7 per cent. and 8 per cent. for 1:2 mortars, and 14 per cent., 15 per cent., 16 per cent. and 17 per cent. for 1:4 mortars would show within one per cent. where the maximum strengths were developed.

The writer begs to acknowledge the courtesy shown by members of the staff of the Faculty of Applied Science of the University of Toronto, whose personal interest and assistance in the laboratory facilitated the work.

Respectfully submitted,

(Sgd.) G. Cameron Parker, B.A.Sc.,

Assistant Engineer.

Appendix C.

NON-ASPHALTIC ROAD OILS.

W. A. McLean, Esq., C.E.,

Chief Engineer of Highways,

Ontario.

Sir,—I wish to propose the following specifications for non-asphaltic roads oils consequent upon my investigation into this matter during the past months:

The oil must—

(1) Be free from obnoxious odors.
(2) Have no injurious effect on rubber tires.
(3) Have a gravity of not less than .870 at 20°C.
(4) Contain not more than 1.25 per cent. sulphur.
(5) Contain not more than four per cent. paraffin scale.
(6) When twenty grams are evaporated at a temperature of 100 degrees Centigrade, for three hours, in a shallow dish of about eight square inches area, the loss shall not be more than five per cent.

Of the six clauses I deem the sixth the most important since it, to my mind, represents the efficiency of the oil in actual working conditions. It may be that the oils obtainable can not come up to these requirements and in that case it appears advisable to accept those that approach the nearest, drawing fresh limits to suit the material available.

If the manufacturers by reason of these specifications begin to submit heavier oils it will be necessary to give probably, a maximum gravity limit, a viscosity value, etc.

There is to be considered also the question of price with the quality. This I think can only be determined by asking various firms to quote on the above specifications.

It must be carefully borne in mind that the specifications as drawn up are the product of the laboratory and not of field tests. These latter, conducted under the supervision of one of your engineers in a manner which we could readily outline, would give valuable data.

To the compounds of sulphur is usually attributed the evil smell of crude oils. This is only true in part, since it depends upon the state of combination of the sulphur whether it will have an odor or not. The question is much debated as to whether sulphur or unsaturated hydrocarbons cause the odor. The process which eliminates sulphur also reduces the amount of unsaturated matter, so that the final result of sulphur purification is a reduction in the amount of smell evolved. Both asphaltic and non-asphaltic oils contain sulphur up to about one per cent. A high percentage of sulphur is certainly to be avoided, as the decomposition of this matter will probably be a source of nuisance.

The paraffin content is a matter which may have a decided bearing on the efficiency of oil for dust-laying purposes. Paraffin may be soft and similar to vaseline, or may be of the harder variety, approaching the hard white paraffin. The latter type is the one to be avoided, as this may "scale" on the road dust when

the solvent has gone. Again, the paraffin content is serious if the solvent is light and readily volatile, but if the solvent is a heavy oil which fluxes the material well, the whole may then act as a heavy oil, providing, of course, that the paraffin is not present in great excess. Paraffin content should be considered along with the volatility, as will be stated later under that subject.

With regard to the action on tires, it was found that with non-asphaltic oils in which rubber tires were soaked, there was a destruction of the elasticity and a swelling of the rubber occurred. This would seriously affect the value of the tire. High asphaltic oils applied to rubber under the same conditions produced little or no effect. When the experiments were repeated under conditions which approached as nearly as possible working conditions (oil worked into sand) there was very little appreciable effect on the rubber.

The most important effect in regard to lack of efficiency of non-asphaltic oils is volatility, or percentage of low boiling products. These latter are always odorous and very unpleasantly so to many persons. The heat of a hot summer day drives them off as vapor from the road treated. The argument that it is necessary to have low boiling products to secure penetration is indefensible, except possibly with a road of extremely hard surface. One has only to see the consistency of asphaltic oils applied cold to appreciate this. Asphalt itself is hard and brittle and is rendered ideal for dust-laying purposes by fluxing with sufficient heavy oil to render the mass thick and sticky. If a low boiling oil were used to cut the asphalt, and should this oil then evaporate from the road, the asphalt would no longer maintain a tacky consistency or have any sticky properties; so also with non-asphaltic oils containing a possible paraffin base. To be efficient the heavier oils must be present, maintaining the greatest possible fluxing effect on the paraffin. Non-asphaltic oils cannot possibly be as effective as asphaltic oils, since they possess by their inherent nature much less tackiness, and this latter is the property which effects a maximum amount of benefit.

Again, the most obvious evil of volatility is that volatile products are wasted by evaporation and take no part in dust-laying whatever. Ordinary asphaltic oils submitted for dust-laying are not volatile at all at ordinary temperature.

Analysis of Oil Samples.

——	Specific Gravity.	Volatility.	Flash.	Viscosity.	Acid Trace.	Sulphur.	Paraffin.
1—	.866	21.1	75	37	"	0.97	2.0
2—	.875	19.5	55	40	"	0.78	1.4
3—	.861	13.2	85	33	"	0.30	.6
4—	.879	14.2	100	45	"	0.80	3.2
5—	.....	none	.....	.....	.....	0.33	2.3
6—	.....	none	.....	.....	.....	0.35	2.6
7—A sample of crude oil	.....	14.5	.....	.....	.....	0.95	3.1

Volatility is loss at 100 degrees Centigrade.
Flash is in degrees Centigrade.
Viscosity measures on the Redwood instrument.

Respectfully submitted,

(Sgd.) L. Joslyn Rogers.

Appendix D.

TRAFFIC CENSUS, 1914.

W. A. McLean, Esq.,
Chief Engineer of Highways,
Toronto.

Sir,—During the latter week of July and throughout the month of August, 1914, a traffic census was taken around twenty-one cities of Ontario for seven consecutive days, the total number of stations being 235 (represented on the maps by 210 stations), the traffic converging at a road junction being apportioned among the two or more roads concerned. Traffic was counted on 133 roads.

The following were the cities taken into consideration:—

Toronto	Windsor	Chatham
Ottawa	Berlin	Galt
Hamilton	Guelph	Sarnia
London	St. Thomas	Belleville
Brantford	Stratford	Brockville
Kingston	Owen Sound	Woodstock
Peterborough	St. Catharines	Niagara Falls.

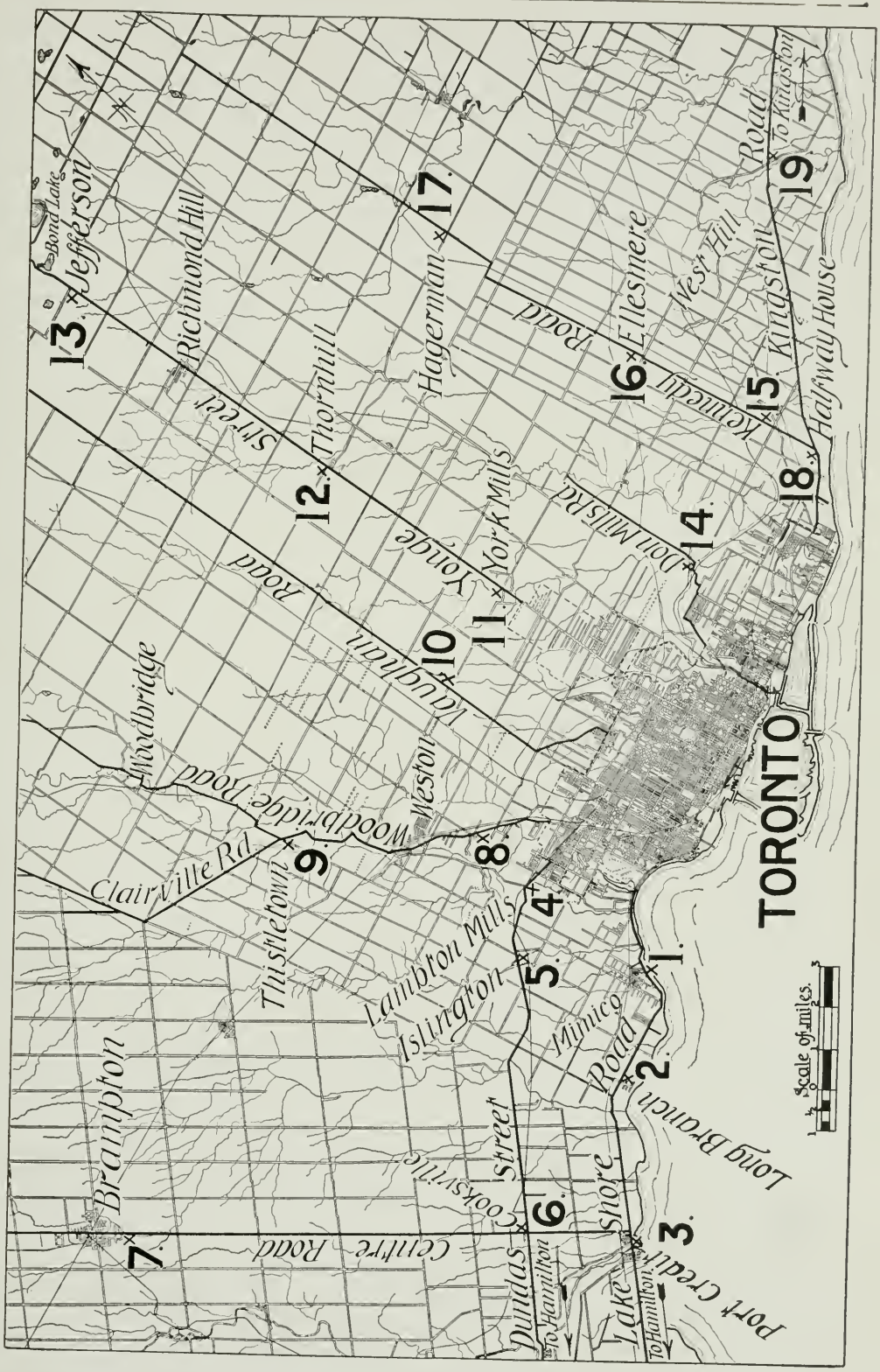
The special cards kept by the census officers had a separate column for tabulating the various classes of vehicles.

Class of Vehicle.	7 a.m. to 9 a.m.	9 a.m. to 11 a.m.	11 a.m. to 1 p.m.	1 p.m. to 3 p.m.	3 p.m. to 5 p.m.	5 p.m. to 7 p.m.	Totals.
One horse light vehicle.....	.....	.....	.....	.....	.....	.....	.....
One horse heavy vehicle....	.....	.....	.....	.....	.....	.....	.....
Two horse light vehicle.....	.....	.....	.....	.....	.....	.....	.....
Two horse heavy vehicle....	.....	.....	.....	.....	.....	.....	.....
Runabout	.....	.....	.....	.....	.....	.....	.....
Touring Car	.....	.....	.....	.....	.....	.....	.....
Motor Truck	.....	.....	.....	.....	.....	.....	.....
Weather conditions	.....	.....	.....	.....	.....	.....	.....

After the cards were received, the number of vehicles observed at each station was tabulated and computed to show the average number of each class of vehicle passing the given station per day and the total number of each class.

The five-passenger Ford car was classed as a touring car in each locality.

Around many of the cities we have to contend with what is called pleasure motor traffic, which uses the road more in the evening than throughout the day. In some places, as Toronto, Ottawa and Kingston, this evening traffic was almost twenty-five per cent. more than the traffic using the roads between the hours of 7 a.m. and 7 p.m.


TORONTO
Bond Lake
Jefferson
Richmond Hill
Thornhill
Hagerman
Ellesmere
West Hill
Kingston
Halfway House
Woodbridge
Weston
York Mills
Don Mills Rd
Kennedy Road
Road
Street
Brampton
Thistletown
Clairville Rd
Islington
Lambton Mills
Mimico
Long Branch
Port Credit
Lake Shore
Dundas Street
Cooksville
Centre Road
To Hamilton
To Kingston
Scale of miles.
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.

Toronto

Census was taken from Monday, August 3rd, to Sunday, August 9th, inclusive.

The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Lake Shore Road	3	1¾, 4½ and 9 miles.
2	Dundas Street	3	½, 3 and 11 miles.
3	Centre Road	2	9½ and 18 miles (via Dundas St.)
4	Woodbridge Road (Weston Road)	2	2 and 6½ miles.
5	Clairville Road	1	6½ miles.
6	Vaughan Road	1	3½ miles.
7	Yonge Street	3	½, 5 and 13 miles.
8	Don Mills Road	1	2½ miles.
9	Kennedy Road	3	2½, 6 and 11 miles.
10	Kingston Road	2	2½ and 9 miles.
		21 (represented by 19 stations on map.)	

Suburban electric railways are on the undermentioned roads and are used extensively by farmers going to and from market:—

Lake Shore Road, for about 8½ miles from city limits.							
Dundas Street	"	"	1	"	"	"	"
Weston Road	"	"	4	"	"	"	"
Yonge Street	"	"	38	"	"	"	"
Kingston Road	"	"	7	"	"	"	"

Within the traffic area and a little beyond there are several railway shipping points, viz.: Woodbridge, Weston, Thornhill, Unionville, Markham, Agincourt, Scarboro, Port Credit, Brampton and Malton. These cause a large amount of local traffic.

There are several brick works in vicinity which cause a heavy two-horse vehicle traffic locality.

The Toronto Civic Holiday was the cause of heavy motor traffic on all roads on Monday, August 3rd. This was very noticeable at Station 5 on Dundas Street, where the number of motor cars was 569.

Lake Shore Road, Dundas Street, Yonge Street, and Kingston Road carry a very heavy motor traffic between the hours of 7 and 11 p.m. This pleasure traffic confines itself to the good section of these roads, and perhaps make a few trips each night.

The Lake Shore Road just within the city limits was partly closed owing to construction of a concrete pavement, thereby causing inconvenience to the users of this popular highway, and making motorists avoid this section and travel on roads north instead.

Kennedy Road was being repaired in two places while the census was being taken. This caused inconvenience to motorists, many of whom perhaps avoided this road.

A route greatly used by motorists from Toronto is by way of Dundas Street to Cooksville, thence north on Centre Road to Brampton, thence east on Clairville Road passing through Woodhill, Grahamville, Humber to Thistletown, thence south on Woodbridge and Weston Road to Toronto. The stations showing census on above route are:—4, 5, 6, 7, 9 and 8.

On each sheet showing census tabulated, are a few remarks as to extra heavy traffic.

The roads adjacent to city are in pretty fair condition.

LAKE SHORE ROAD—Station No. 1—Mimico.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Fair	Total	Daily Average
One horse light vehicle	118	96	86	112	100	73	52	637	91.0
One horse heavy vehicle	10	11	11	13	10	15	.....	70	10.0
Two horse light vehicle	8	39	29	30	39	21	.....	166	23.7
Two horse heavy vehicle	20	37	49	43	51	31	2	233	33.3
Runabout	34	19	31	31	31	37	44	227	32.4
Touring Car	268	142	157	117	148	193	307	1,332	190.2
Motor Trucks	11	29	19	24	21	23	3	130	18.6
Total	469	373	382	370	400	393	408	2,795	399.2

Condition of Road:—Surface rough in places, but solid and dry.
Remarks:—There is a heavy motor truck traffic to and from a sewer-pipe factory in the vicinity.

LAKE SHORE ROAD—Station No. 2—Long Branch.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Total	Daily Average
One horse light vehicle	101	18	18	23	27	25	36	248	35.4
One horse heavy vehicle	28	39	30	44	47	40	5	233	33.3
Two horse light vehicle	6	9	10	11	22	14	.....	72	10.3
Two horse heavy vehicle	24	41	44	50	46	32	1	238	34.0
Runabout	23	15	10	11	14	11	31	115	16.4
Touring Car	191	119	124	91	107	165	204	1,001	143.0
Motor Truck	9	18	18	18	14	22	2	101	14.4
Total	382	259	254	248	277	309	279	2,008	286.8

Condition of Road:—Surface rough, but solid and dry.
Remarks:—This road is used a great deal at night by automobiles.

LAKE SHORE ROAD—Station No. 3—Port Credit.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Fair	Total	Daily Average
One horse light vehicle	160	117	82	100	77	100	62	698	99.7
One horse heavy vehicle	21	49	95	82	85	73	8	413	59.0
Two horse light vehicle	39	10	2	2	4	3	.....	60	8.5
Two horse heavy vehicle	35	69	66	67	47	56	8	348	49.8
Runabout	28	22	24	17	19	22	18	150	21.4
Touring Car	234	173	128	110	98	162	145	1,050	150.0
Motor Truck	3	22	14	18	14	10	.....	81	11.6
Total	520	462	411	396	344	426	241	2,800	400.0

Condition of Road:—Surface rough in places, but solid.
Remarks:—Sand hills about 1½ miles west of station cause motorists to strike north to get on Middle Road, if going to Oakville and beyond.
The increased traffic at this point compared with Station No. 2 is due to local traffic.

DUNDAS STREET—Station No. 4—Junction of Scarlett Road.

Wednesday, August 26th, to Tuesday, September 1. inclusive; 7 a.m. to 7 p.m.

Class of Traffic	Wed. Cloudy	Thur. Cloudy	Fri. Clo'dy	Sat. Wet	Sun. Cloudy	Mon. Fine	Tues. Wet	Total	Daily Average
One horse light vehicle.....	111	91	113	70	134	81	66	666	95.1
One horse heavy vehicle....	215	233	262	142	13	214	151	1,230	175.7
Two horse light vehicle.....	.....	1	.....	1	3	.....	7	12	1.7
Two horse heavy vehicle....	210	264	291	139	23	204	303	1,434	204.8
Runabout	69	53	86	30	100	38	21	397	56.7
Touring Car	360	327	375	170	553	234	124	2,143	306.1
Motor Truck	31	20	46	17	.....	21	15	150	21.6
Total	996	989	1,173	569	826	792	687	6,032	861.7

Condition of Road:—Stone road surface treated with oil, very rough, but solid.
Remarks:—The two-horse heavy vehicle traffic is excessive, which is to and from sand and gravel pits on Scarlett Road. A large amount of motor car traffic is to and from Golf Club, located near by.
The large majority of heavy vehicle traffic is confined to first mile of road, many teams perhaps making four trips daily.
The Toronto Exhibition was on while this census was being taken, but it is doubtful whether this would cause any considerable increase of traffic.

DUNDAS STREET—Station No. 5—Islington P.O.

Monday August 3. to Sunday August 9, inclusive; 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair.	Tues. Fair.	Wed. Fair.	Thur. Fair.	Fri. Fair.	Sat. Fair.	Sun. Fair..	Total	Daily Average
One horse light vehicle.....	156	118	115	87	111	94	92	773	110.4
One horse heavy vehicle....	32	88	87	66	68	55	7	403	57.5
Two horse light vehicle.....	2	16	5	9	7	14	.....	53	7.6
Two horse heavy vehicle....	65	100	83	70	97	77	16	508	72.5
Runabout	80	36	34	18	37	55	82	342	48.8
Touring Car	569	208	221	218	195	286	402	2,099	299.9
Motor Truck	6	24	24	15	14	16	1	100	14.4
Total	910	590	569	483	529	597	600	4,278	611.1

Condition of Road:—Stone road, in good condition.
Remarks:—Surface treated with tar and sand. A large amount of two-horse heavy vehicles is due to building of road north of station.
The road a few miles west of station, near Somerville, is in rather bad condition, which causes many motorists to stop and return. In other words, many use the section of good road perhaps three or four times a day.

DUNDAS STREET—Station No. 6—Cooksville (Junction of Centre Road).

Monday, August 3 to Sunday August 9, inclusive: 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fine.	Tues. Fine.	Wed. Fine.	Thur. Fine.	Fri. Fine.	Sat. Fine.	Sun. Fine.	Total	Daily Average
One horse light vehicle.....	96	75	121	160	138	96	86	772	110.2
One horse heavy vehicle....	53	67	64	39	57	75	.....	355	50.7
Two horse light vehicle.....	55	21	56	37	12	17	7	205	29.4
Two horse heavy vehicle....	63	65	89	85	93	125	5	525	75.0
Runabout	85	38	71	37	66	121	163	581	83.0
Touring Car	335	127	225	169	239	259	248	1,602	228.8
Motor Truck	1	15	12	17	16	26	.....	87	12.4
Total	688	408	638	544	621	719	509	4,127	589.5

Condition of Road:—Stone road, in fair condition.
Remarks:—The heavy two-horse vehicle traffic is from brick works located west of station. Around this point there is a large amount of purely local traffic.

CENTRE ROAD—Station No. 6—Cooksville (Junction of Dundas Street).

Monday, August 3, to Sunday, August 9, inclusive; 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fine	Total	Daily Average
One horse light vehicle.....	37	42	93	55	111	86	56	480	68.5
One horse heavy vehicle....	57	29	49	45	28	67	.....	275	39.4
Two horse light vehicle.....	27	30	19	31	25	30	29	191	27.2
Two horse heavy vehicle....	39	43	66	78	167	94	.....	487	69.8
Runabout	48	27	11	11	54	57	102	310	44.2
Touring Car	145	59	108	103	169	162	180	926	132.2
Motor Truck	.....	8	5	15	6	7	.....	41	5.8
Total	353	238	351	338	560	503	367	2,710	387.1

Condition of Road:—Stone road, in very good condition.
Remarks:—The two-horse heavy vehicle traffic is heavy; this is caused by traffic to and from brick works west of station.

CENTRE ROAD—Station No. 7—Brampton (South Town Limit).

Monday, August 3, to Sunday, August 9, inclusive; 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Fine	Fri. Fair	Sat. Fine	Sun. Fine	Total	Daily Average
One horse light vehicle.....	61	50	39	44	29	70	34	327	46.7
One horse heavy vehicle....	6	4	12	2	5	6	1	36	5.1
Two horse light vehicle.....	1	.....	.....	.....	1	5	5	12	1.7
Two horse heavy vehicle....	27	21	8	10	12	12	2	92	13.1
Runabout	45	10	24	15	16	21	27	158	22.5
Touring Car	146	96	119	99	91	92	122	765	109.2
Motor Truck	.....	.....	.....	.....	2	.....	.....	2	0.5
Total	286	181	202	170	156	206	191	1,392	198.8

Condition of Road:—Stone road, in very good condition.

WOODBRIDGE ROAD (WESTON ROAD)—Station No. 8—N.W. of Eglinton Avenue.

Monday, August 3, to Sunday, August 9, inclusive; 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Total	Daily Average
One horse light vehicle.....	69	56	49	71	48	79	71	443	63.2
One horse heavy vehicle....	70	188	172	140	183	137	6	896	128.0
Two horse light vehicle.....	.....	.....	4	3	5	8	.....	20	2.8
Two horse heavy vehicle....	86	200	162	189	219	146	37	1,039	148.4
Runabout	22	16	12	17	17	20	13	117	16.7
Touring Car	113	100	99	79	80	88	115	674	96.4
Motor Truck	4	15	25	16	19	10	2	91	13.0
Total	364	575	523	515	571	488	244	3,280	468.5

Condition of Road:—Stone road, solid, but very rough.
Remarks:—The two-horse heavy vehicle traffic is exceedingly heavy on this part of road to and from sand and gravel pits, as well as buildings in course of erection.

WOODBRIDGE ROAD—Station No. 9—Thistletown (Junction of Clairville Road).

Including traffic from Clairville Road.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fine	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Cloudy	Total	Daily Average
One horse light vehicle.....	69	67	45	41	49	93	56	420	60.0
One horse heavy vehicle....	6	22	8	9	14	25	.....	84	12.0
Two horse light vehicle.....	6	11	.....	9	12	1	1	40	5.7
Two horse heavy vehicle....	23	35	33	28	48	51	15	233	33.3
Runabout	3	11	3	7	8	7	15	54	7.7
Touring Car	40	17	22	16	19	45	48	207	29.5
Motor Truck	1	2	.....	3	.....	.....	.....	6	0.9
Total	148	165	111	113	150	222	135	1,044	149.1

Condition of Road:—Surface treated with oil, in good condition.
Remarks:—The purpose of this card is to show the actual traffic using road. In other words, this is the traffic using both Chairville Road and Woodbridge Road.

WOODBRIDGE ROAD—Station No. 9—Thistletown (Junction of Clairville Road).

Excluding traffic from Clairville Road.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fine	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Cloudy	Total	Daily Average
One horse light vehicle.....	35	36	30	20	31	48	28	228	32.6
One horse heavy vehicle....	5	6	4	5	5	10	.....	35	5.0
Two horse light vehicle.....	6	8	.....	3	5	1	1	24	3.4
Two horse heavy vehicle....	15	26	21	13	31	16	6	128	18.3
Runabout	1	6	1	3	3	6	8	28	4.0
Touring Car	21	10	12	8	12	15	21	99	14.1
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	83	92	68	52	87	96	64	542	77.4

Condition of Road:—Stone road, in good condition; surface treated with oil.

CLAIRVILLE ROAD—Station No. 9—Thistletown (Junction of Woodbridge Road).

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fine	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Cloudy	Total	Daily Average
One horse light vehicle.....	34	31	15	21	18	45	28	192	27.4
One horse heavy vehicle....	1	16	4	4	9	15	.....	49	7.0
Two horse light vehicle.....	.....	3	.....	6	7	.....	.....	16	2.3
Two horse heavy vehicle....	8	9	12	15	17	35	9	105	15.0
Runabout	2	5	2	4	5	1	7	26	3.7
Touring Car	19	7	10	8	7	30	27	108	15.4
Motor Truck	1	2	.....	3	.....	.....	.....	6	0.9
Total	65	73	43	61	63	126	71	502	71.7

Condition of Road:—Stone road, in good condition.

VAUGHAN ROAD—Station No. 10—Lot 10, Concession II. York Township.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Fair	Fri. Fine	Sat. Fine	Sun. Fine	Total	Daily Average
One horse light vehicle.....	81	34	28	25	32	25	45	270	38.5
One horse heavy vehicle....	28	20	13	12	14	20	3	110	15.7
Two horse light vehicle.....	2	2	1	1	1	2	1	10	1.7
Two horse heavy vehicle....	81	80	78	84	90	88	4	505	72.1
Runabout	12	5	9	4	2	5	11	48	6.8
Touring Car	48	31	25	19	30	27	57	237	33.8
Motor Truck	3	5	6	8	11	1	.....	34	4.8
Total	255	177	160	153	180	168	121	1,214	173.4

Condition of Road:—Stone road, in good condition.
Remarks:—About 1½ miles north of station, the road was being re-constructed. The teaming of road material accounts for most of the two-horse heavy vehicle traffic.

YONGE STREET—Station No. 11—York Mills.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fine	Total	Daily Average
One horse light vehicle.....	89	35	32	35	58	73	34	356	50.8
One horse heavy vehicle...	15	55	28	24	21	18	.....	161	23.0
Two horse light vehicle.....	3	17	5	11	41	19	1	97	13.8
Two horse heavy vehicle....	39	72	82	57	54	76	4	384	54.8
Runabout	60	31	26	18	29	40	39	243	34.9
Touring Car	435	258	205	171	197	322	453	2,041	291.5
Motor Truck	3	19	27	18	14	10	3	94	13.4
Total	644	487	405	334	414	558	534	3,376	482.2

Condition of Road:—Stone road, in good condition; surface treated with tar and sand.

YONGE STREET—Station No. 12—Thornhill P.O.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Total	Daily Average
One horse light vehicle.....	43	37	33	35	40	66	74	328	46.8
One horse heavy vehicle....	8	17	25	19	25	36	4	134	19.1
Two horse light vehicle.....	2	5	1	.....	1	.....	1	10	1.7
Two horse heavy vehicle....	15	10	10	23	27	55	.....	140	20.0
Runabout	55	22	16	18	22	23	35	191	27.2
Touring Car	371	178	142	116	116	261	300	1,484	212.0
Motor Truck	6	14	23	14	7	7	1	72	10.2
Total	500	283	250	225	238	448	415	2,359	337.0

Condition of Road:—Stone road, in very good condition.

YONGE STREET—Station No. 13—Jefferson P.O.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Fair	Fri. Fair	Sat. Fine	Sun. Fine	Total	Daily Average
One horse light vehicle.....	19	11	3	10	13	12	21	89	12.7
One horse heavy vehicle....	1	4	5	3	1	2	.....	16	2.2
Two horse light vehicle.....	4	1	.....	1	.....	2	.....	8	1.1
Two horse heavy vehicle....	4	16	6	2	5	1	.....	34	4.8
Runabout	34	16	9	6	8	6	21	100	14.3
Touring Car	311	148	98	63	76	148	237	1,081	154.6
Motor Truck	3	2	4	.....	.....	.....	1	10	1.4
Total	376	198	125	85	103	171	280	1,338	191.1

Remarks:—Stone road, in good condition; but about ¼ mile north of station the road is very poor, this being the end of the County Roads System.

DON MILLS ROAD—Station No. 14—Bridge over River Don.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fine	Tues. Fair	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fine	Total	Daily Average
One horse light vehicle.....	82	53	49	58	47	68	52	409	58.4
One horse heavy vehicle....	30	49	35	35	8	26	35	218	31.1
Two horse light vehicle.....	.....	14	10	14	.....	7	7	52	7.4
Two horse heavy vehicle....	30	55	29	24	4	22	38	202	28.8
Runabout	4	10	12	7	7	9	4	53	7.5
Touring Car	24	8	15	14	30	26	14	131	18.8
Motor Truck	.....	.....	2	4	.....	4	.....	10	1.5
Total	170	189	152	156	96	162	150	1,075	153.5

Condition of Road:—Stone road, very rough but solid.

KENNEDY ROAD—Station No. 15—Junction of Danforth Road.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Fair	Fri. Fine	Sat. Fine	Sun. Fine	Total	Daily Average
One horse light vehicle.....	66	36	31	33	41	42	57	306	43.7
One horse heavy vehicle....	27	51	44	47	50	68	6	293	41.8
Two horse light vehicle.....	12	17	6	22	17	11	.....	85	12.1
Two horse heavy vehicle....	15	29	38	42	43	31	6	204	29.1
Runabout	70	13	22	14	21	38	73	251	35.8
Touring Car	46	32	32	28	30	37	78	283	40.7
Motor Truck	2	8	5	.....	4	4	.....	23	3.2
Total	238	186	178	186	206	231	220	1,445	206.4

Condition of Road:—Stone road, in fair condition.

KENNEDY ROAD—Station No. 16—Ellesmere P.O.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fine	Total	Daily Average
One horse light vehicle.....	21	15	15	27	19	18	40	155	22.1
One horse heavy vehicle....	7	18	9	22	9	31	5	101	14.4
Two horse light vehicle.....	3	5	6	15	6	7	.....	42	6.0
Two horse heavy vehicle....	9	13	13	19	24	16	4	98	14.0
Runabout	9	3	.....	1	5	7	1	26	3.7
Touring Car	53	27	34	29	30	31	80	284	40.7
Motor Truck	.....	2	1	.....	3	.....	.....	6	0.8
Total	102	83	78	113	96	110	130	712	101.7

Condition of Road:—Stone road, in good condition. Road north of station being repaired in two places.

KENNEDY ROAD—Station No. 17—Hagerman's Corners.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fine	Total	Daily Average
One horse light vehicle.....	24	21	27	22	29	17	27	167	23.8
One horse heavy vehicle....	4	4	6	5	3	1	.....	23	3.2
Two horse light vehicle.....	10	.....	3	4	9	8	1	35	5.0
Two horse heavy vehicle....	56	55	49	50	40	59	.....	309	44.1
Runabout	.....	4	1	.....	.....	1	1	7	1.0
Touring Car	43	15	14	9	14	14	40	149	21.2
Motor Truck	.....	.....	.....	2	2	.....	.....	4	0.8
Total	137	99	100	92	97	100	69	694	99.1

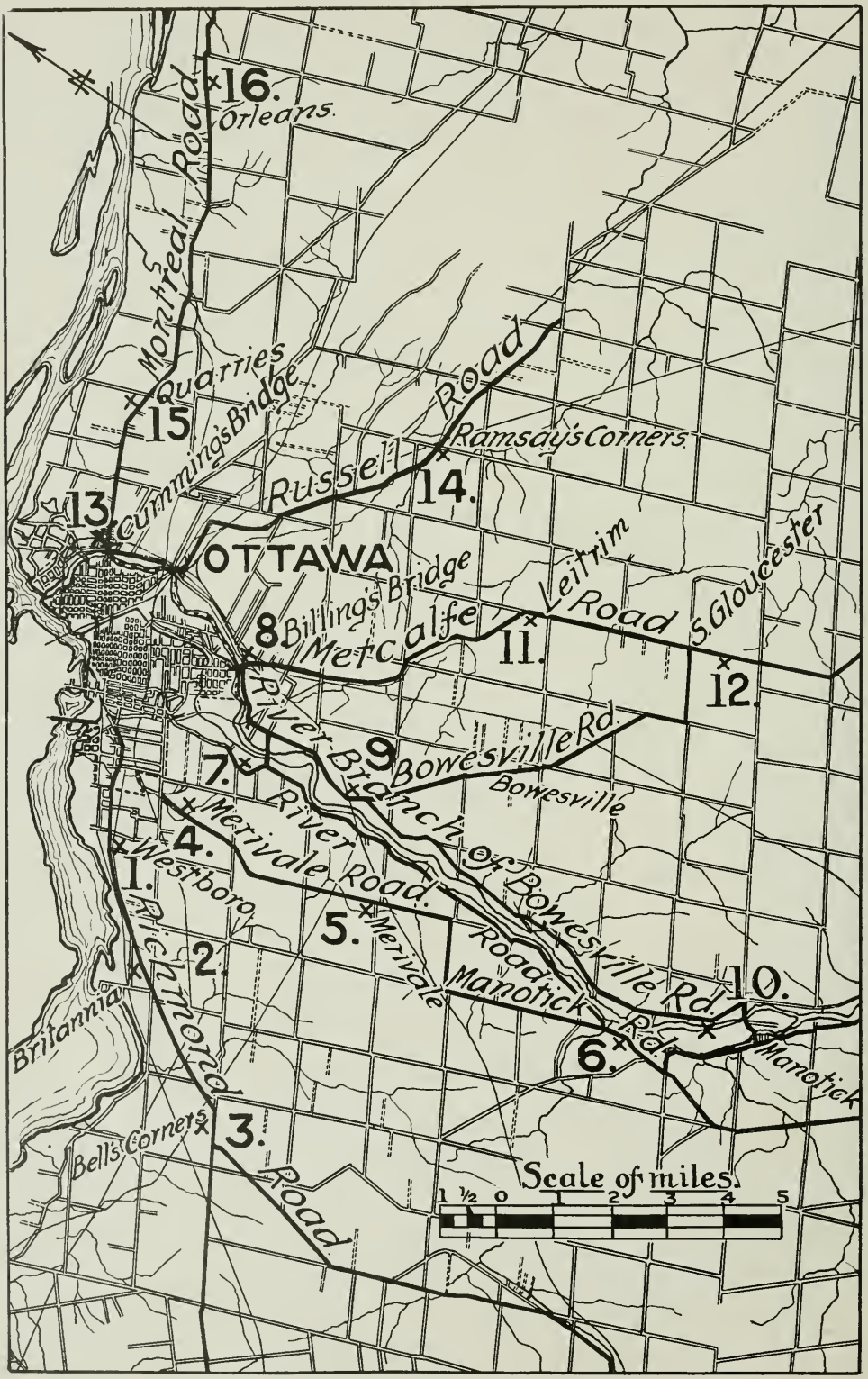
Condition of Road:—Stone road, in fair condition; road being repaired a little south of station.

KINGSTON ROAD—Station No. 18—Halfway House.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Cloudy	Fri. Cloudy	Sat. Fair	Sun. Fair	Total	Daily Average
One horse light vehicle.....	131	69	42	52	63	70	66	493	70.5
One horse heavy vehicle....	.....	2	11	35	30	22	1	101	14.5
Two horse light vehicle.....	11	23	8	11	2	1	5	61	8.7
Two horse heavy vehicle....	33	47	43	46	52	72	14	307	43.8
Runabout	102	24	43	24	12	16	39	260	37.1
Touring Car	440	177	177	167	159	337	533	1,990	284.2
Motor Truck	3	12	13	8	6	2	.....	44	6.3
Total	720	354	337	343	324	520	658	3,256	465.1

Condition of Road:—Stone road, in good condition; surface in places treated with tar.


16.
Orleans.
Montreal Road
Quarries
15
Cummings Bridge
Russell Road
Ramsay's Corners
14.
13
OTTAWA
Billings Bridge
Merivale
8
11.
Leitrim Road
S. Gloucester
12.
River
9
Bowesville Rd.
Bowesville
7.
Merivale Road.
4.
Westboro
1.
River
5.
Merivale
Road
2.
Britannia
Richmond
Road
Manotick Rd.
10.
6.
Manotick
Bell's Corners
3.
Scale of miles.
1 ½ 0 1 2 3 4 5

KINGSTON ROAD—Station No. 19—Half-mile East of West Hill.

Monday, August 3, to Sunday, August 9, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Total	Daily Average
One horse light vehicle.....	79	43	39	37	30	76	63	367	52.6
One horse heavy vehicle....	8	16	14	14	17	15	.....	84	12.0
Two horse light vehicle.....	3	5	1	1	5	1	2	18	2.5
Two horse heavy vehicle....	2	17	10	12	18	19	1	79	11.2
Runabout	35	14	9	10	12	13	19	112	16.0
Touring Car	280	114	121	82	89	164	256	1,106	158.0
Motor Truck	4	.....	.....	2	2	.....	.....	8	1.1
Total	411	209	194	158	173	288	341	1,774	253.4

Condition of Road:—Gravel road, in poor condition; badly rutted.

Ottawa.

Census was taken from Tuesday, July 28, to Monday, August 3, inclusive. The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Richmond Road	3	1, 3½ and 7 miles.
2	Merivale Road (*Manotick Road*)	3	0, 4½ and 9½ miles.
3	River Road (*Ottawa-Prescott*)	2	1½ and 9½ miles.
4	River Branch of Bowesville Road	3	0, 3½ and 11 miles.
5	Metcalfe Road (*Ottawa-Morrisburg*)	3	0, 6 and 9 miles.
6	Russell Road	2	0 and 7 miles.
7	Montreal Road	3	0, 3½ and 9 miles.
		19	(represented by 16 stations on map).

All roads leading from city are toll roads; the majority are in good condition, the lengths of these varying from 1½ miles to 10 miles.

Within this traffic area are several places of importance, though not market or shipping points, viz., Westboro, Graham's Bay, Britannia, Merivale, and Billing's Bridge. These cause a certain amount of local traffic.

The City Council ships a large quantity of crushed stone from a quarry located about 1½ miles from the city limits on Merivale Road; the loads carried vary from 3 to 4 tons. On this section of road the toll was discontinued during the summer in which the census was taken, on account of excessive traffic from this quarry, which cut up the road surface. The average daily number of vehicles from this quarry is 69, as shown in the schedule under Station 4. Following is a census of two-horse heavy wagons to and from stone quarry, which is included in the above: Tuesday, 85; Wednesday, 72; Thursday, 67; Friday, 53; Saturday, 80; Monday, 57; total, 414; a daily average of 69 wagons. This traffic uses road for 1½ miles from city limits.

The Ottawa Dairy Co. has a large farm located on Lot 1, Concession A, and ships a large quantity of milk daily to the city. The motor trucks of this company use Merivale Road for a length of 3½ miles, which traffic is shown in the schedule under Station 4. Some of this dairy traffic uses the road early in the morning, and is therefore not taken into account.

There are numerous cheese factories adjacent to the city, some of the traffic from which, going to market, uses the road mostly before 7 a.m. and returns after 7 p.m.

There is a brickyard located about ½ mile west of Station 8 on Bowesville Road, which accounts for the greater part of heavy vehicle traffic; also on Metcalfe Road, within 1 mile of city limits there are a large number of buildings in course of erection, which would account for a number of heavy vehicles on this road.

Montreal Road carries some very heavy traffic to and from stone quarries and gravel pits located on this road. This traffic uses road for about 3 miles, as shown in the schedule under Station 13.

On Richmond Road there is a great deal of motor pleasure traffic after 7 p.m. After paying toll at the first gate this traffic runs back and forth between the toll gates for a distance of seven miles.

The summer homes along the bank of the Ottawa River cause quite a lot of traffic on Richmond Road. These homes are yearly increasing in number.

While the census was being taken at Cumming's Bridge on Russell Road (Station 13), Hurdman's Bridge, about one mile south of this station was reopened to traffic. This diverted a considerable amount of traffic from Russell Road, which was anticipated to pass Station 13 when a choice of stations was made.

The traffic on Metcalfe Road at Station 12 divides near this point, some going by way of Bowesville Road, the remainder by Metcalfe Road. This is the reason why the traffic is greater at Station 12 than at Station 11.

The roads, with the exception of toll roads, are very poor, some being gravel, others clay and sand.

RICHMOND ROAD—Station No. 1—Westboro.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Rain	Sun. Cloudy	Mon. Fair	Total	Daily Average
One horse light vehicle.....	235	235	238	205	329	70	195	1,507	215.3
One horse heavy vehicle....	64	45	58	33	29	.....	27	256	36.6
Two horse light vehicle.....	17	21	28	15	48	3	7	139	19.9
Two horse heavy vehicle....	55	48	67	64	56	.....	54	344	49.1
Runabout	10	9	8	15	18	10	12	82	11.7
Touring Car	133	125	116	93	115	108	132	822	117.4
Motor Truck	24	19	15	23	19	4	5	109	15.6
Total	538	502	530	448	614	195	432	3,259	465.6

Condition of Road:—(Toll road). Stone road; surface treated with tar and sand, in good condition.

Remarks:—Motor traffic on this road after 7 p.m. is very heavy; a good deal of "joy riding" goes on between toll gates, a distance of 7 miles.

RICHMOND ROAD—Station No. 2—East of Junction with March Road, near Britannia.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Cloudy	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle.....	60	50	47	72	31	58	70	388	55.4
One horse heavy vehicle....	27	40	22	77	7	28	32	233	33.3
Two horse light vehicle.....	12	20	14	28	1	16	33	124	17.7
Two horse heavy vehicle....	24	34	30	47	1	23	33	192	27.4
Runabout	9	5	7	8	8	7	7	51	7.3
Touring Car	72	67	54	74	86	108	53	514	73.4
Motor Truck	12	7	17	6	2	2	7	53	7.6
Total	216	223	191	312	136	242	235	1,555	222.1

Condition of Road:—(Toll road). Stone road in good condition; tar surface ends near this station.

RICHMOND ROAD—Station No. 3—Bell's Corners.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Cloudy	Wed. Fair	Thur. Fine	Fri. Cloudy	Sat. Cloudy	Sun. Fair	Mon. Fair	Total	Daily Average
One horse light vehicle.....	30	35	21	52	48	50	57	293	41.9
One horse heavy vehicle....	16	18	18	13	30	4	17	116	16.6
Two horse light vehicle.....	6	2	8	5	10	5	7	43	6.1
Two horse heavy vehicle....	27	24	17	19	23	2	15	127	18.1
Runabout	2	3	2	1	5	6	9	28	4.0
Touring Car	22	20	22	19	34	47	52	216	30.9
Motor Truck	.....	4	.....	1	.....	2	.....	7	1.0
Total	103	106	88	110	150	116	157	830	118.6

Condition of Road:—(Toll road). Stone road, in good condition.

MERIVALE ROAD (MANOTICK ROAD)—Station No. 4—Junction of Carling Avenue.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Fair	Sun. Fine	Mon. Fair	Total	Daily Average
One horse light vehicle.....	121	98	112	114	130	84	116	775	110.7
One horse heavy vehicle....	83	92	86	69	85	2	25	442	63.1
Two horse light vehicle.....	16	10	22	12	48	8	14	130	18.6
Two horse heavy vehicle ...	118	86	119	98	116	3	86	626	89.4
Runabout	.....	3	4	7	2	1	3	20	2.9
Touring Car	23	21	28	14	19	23	27	155	22.1
Motor Truck	9	8	7	7	1	5	5	42	6.0
Total	370	318	378	321	401	126	276	2,190	312.8

Condition of Road:—Toll Road, but when count was taken toll was discontinued owing to state of road, which was badly rutted owing to excessive traffic from stone quarry.

MERIVALE ROAD (MANOTICK ROAD)—Station No. 5—Merivale.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Cloudy	Wed. Fine	Thur. Fine	Fri. Cloudy	Sat. Fine	Sun. Cloudy	Mon. Fine	Total	Daily Average
One horse light vehicle.....	11	19	15	7	20	23	20	115	16.4
One horse heavy vehicle....	14	12	13	16	12	19	7	93	13.2
Two horse light vehicle.....	2	1	.....	.....	6	1	2	12	1.8
One horse heavy vehicle....	16	10	22	13	18	4	16	99	14.1
Runabout	.....	.....	.....	.....	.....	.....	.....	.....	.....
Touring Car	6	5	9	3	5	12	8	48	6.9
Motor Truck	2	2	2	2	.....	2	2	12	1.7
Total	51	49	61	41	61	61	55	379	54.1

Condition of Road:—(Toll Road, ending here, continued by County Road). Stone road, in good condition to end of Toll Road.

MERIVALE ROAD (MANOTICK ROAD)—Station No. 6—Junction of River Road.
Including traffic from River Road.
Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Fine	Thur. Fine	Fri. Fair	Sat. Fair	Sun. Fine	Mon. Fair	Total	Daily Average
One horse light vehicle.....	13	11	16	7	17	14	28	106	15.1
One horse heavy vehicle....	2	1	6	1	2	2	8	22	3.1
Two horse light vehicle.....	2	2	.....	.....	.....	.....	1	5	0.7
Two horse heavy vehicle....	.....	6	13	6	9	.....	1	35	5.1
Runabout	.....	.....	.....	2	1	1	.....	4	0.6
Touring Car	2	2	9	7	2	5	2	29	4.2
Motor Truck	.....	.....	1	1	.....	.....	.....	2	0.3
Total	19	22	45	24	31	22	40	203	29.1

Condition of Road:—Gravel road, in good condition.

MERIVALE ROAD (MANOTICK ROAD)—Station No. 6—Junction of River Road.
Excluding traffic from River Road.
Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Fine	Thur. Fine	Fri. Fair	Sat. Fair	Sun. Fine	Mon. Fair	Total	Daily Average
One horse light vehicle.....	7	4	7	4	10	5	10	47	6.7
One horse heavy vehicle....	1	.....	1	1	1	1	3	8	1.1
Two horse light vehicle.....	.....	1	.....	.....	.....	.....	1	2	0.3
Two horse heavy vehicle....	.....	1	4	6	4	.....	.....	15	2.2
Runabout	.....	.....	.....	2	1	.....	.....	3	0.4
Touring Car	.....	2	6	5	.....	1	1	15	2.2
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	8	8	18	18	16	7	15	90	12.9

Condition of Road:—Stone road, for 6½ miles from city limits in fair condition; the remainder a clay road, in poor condition. The first 4 miles from city is a Toll Road, the first mile being badly cut up by traffic to and from stone quarries.

RIVER ROAD—Station No. 7—Toll House, South of Experimental Farm.
Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fine	Mon. Fine	Total	Daily Average
One horse light vehicle.....	25	24	30	23	24	55	19	200	28.6
One horse heavy vehicle....	6	7	11	5	13	3	13	58	8.2
Two horse light vehicle.....	3	2	3	.....	6	4	.....	18	2.5
Two horse heavy vehicle....	51	51	49	49	47	1	55	303	43.4
Runabout	.....	.....	.....	.....	.....	.....	.....	.....	.....
Touring Car	14	4	7	10	9	22	13	79	11.2
Motor Truck	.....	1	1	1	.....	.....	.....	3	0.5
Total	99	89	101	88	99	85	100	661	94.4

Condition of Road:—(Toll Road ending here). Stone road for 1½ miles in good shape, to end of Toll Road—from this point onwards it is mostly gravel and earth road, in poor condition.
Remarks:—Fairly heavy traffic from brick works, located about ¾ mile south of station.

RIVER ROAD—Station No. 6—Junction of Merivale Road (Manotick Road)

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Fine	Thur. Fine	Fri. Fair	Sat. Fair	Sun. Fine	Mon. Fair	Total	Daily Average
One horse light vehicle.....	6	7	9	3	7	9	18	59	8.4
One horse heavy vehicle....	1	1	5	.....	1	1	5	14	2.0
Two horse light vehicle.....	2	1	.....	.....	.....	.....	.....	3	0.4
Two horse heavy vehicle....	.....	5	9	.....	5	.....	1	20	2.9
Runabout	.....	.....	.....	.....	.....	1	.....	1	0.2
Touring Car	2	.....	3	2	2	4	1	14	2.0
Motor Truck	.....	.....	1	1	.....	.....	.....	2	0.3
Total	11	14	27	6	15	15	25	113	16.2

Condition of Road:—Gravel road in poor condition. Clay road in parts badly cut up.

RIVER BRANCH OF BOWESVILLE ROAD—Station No. 8—Toll House, Junction of Metcalfe Road.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fine	Mon. Fine	Total	Daily Average
One horse light vehicle.....	57	36	88	75	121	126	115	618	88.2
One horse heavy vehicle....	43	48	108	90	197	13	89	588	84.0
Two horse light vehicle.....	4	.....	.....	.....	5	.....	9	18	2.6
Two horse heavy vehicle....	82	84	80	74	95	2	47	464	66.3
Runabout	.....	3	3	.....	5	8	8	27	3.9
Touring Car	20	25	45	28	44	27	57	246	35.1
Motor Truck	11	20	9	8	4	3	16	71	10.1
Total	217	216	333	275	471	179	341	2,032	290.2

Condition of Road:—(Toll Road). Stone road for 3½ miles in good shape, to end of Toll Road.
Remarks:—Farming accounts for most of heavy vehicle traffic. There is also a brick work located about ½ mile west of station.

RIVER BRANCH OF BOWESVILLE ROAD—Station No. 9—North of Junction of Bowesville Road.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Cloudy	Wed. Fair	Thur. Cloudy	Fri. Rain	Sat. Rain	Sun. Rain	Mon. Fair	Total	Daily Average
One horse light vehicle.....	32	30	27	13	45	33	22	202	28.9
One horse heavy vehicle....	18	7	24	8	35	3	6	101	14.5
Two horse light vehicle.....	5	1	.....	.....	.....	2	1	9	1.2
Two horse heavy vehicle....	14	19	27	19	40	5	18	142	20.3
Runabout	.....	2	7	2	2	5	2	20	2.8
Touring Car	5	5	19	9	10	26	24	98	14.0
Motor Truck	.....	2	.....	.....	2	.....	1	5	0.7
Total	74	66	104	51	134	74	74	577	82.4

Condition of Road:—(Toll Road, ending here). Stone road in good shape.

RIVER BRANCH OF BOWESVILLE ROAD—Station No. 10—Town Line of Gloucester and Osgoode.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Fair	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Shwrs	Mon. Fine	Total	Daily Average
One horse light vehicle.....	16	22	27	25	25	46	34	195	27.8
One horse heavy vehicle....	4	2	4	1	3	.....	.....	14	2.0
Two horse light vehicle.....	3	1	1	3	3	.....	2	13	1.9
Two horse heavy vehicle....	4	6	1	9	11	.....	2	33	4.8
Runabout	.....	.....	.....	.....	1	.....	.....	1	0.1
Touring Car	2	2	3	1	2	4	6	20	2.8
Motor Truck	.....	.....	1	.....	.....	.....	.....	1	0.1
Total	29	33	37	39	45	50	44	277	39.5

Condition of Road—Sand road, in poor condition.

METCALFE ROAD—Station No. 8—Toll House (Junction of River Branch of Bowesville Road).

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Cloudy	Sun. Cloudy	Mon. Fine	Total	Daily Average
One horse light vehicle.....	111	95	49	36	66	68	46	471	67.3
One horse heavy vehicle....	102	98	50	34	79	7	21	391	55.9
Two horse light vehicle.....	7	1	.....	.....	.....	1	2	11	1.6
Two horse heavy vehicle....	59	90	74	64	89	4	25	405	57.9
Runabout	2	4	3	.....	3	7	5	24	3.4
Touring Car	44	35	25	21	19	33	31	208	29.7
Motor Truck	9	14	3	4	11	2	6	49	7.0
Total	334	337	204	159	267	122	136	1,559	222.8

Condition of Road:—(Toll Road). Stone road, in fair shape.
Remarks:—The heavy traffic is composed mostly of dairy and farming traffic.

METCALFE ROAD—Station No. 11—Leitrim Toll House.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Cloudy	Wed. Cloudy	Thur. Fair	Fri. Fair	Sat. Cloudy	Sun. Fair	Mon. Total	Total	Daily Average
One horse light vehicle.....	25	32	27	26	61	47	103	321	45.9
One horse heavy vehicle....	17	9	11	2	7	2	3	51	7.3
Two horse light vehicle.....	7	5	19	15	19	.....	9	74	10.6
Two horse heavy vehicle....	8	8	11	12	20	1	6	66	9.4
Runabout	2	6	3	.....	3	2	3	19	2.7
Touring Car	23	12	18	10	25	19	50	157	22.4
Motor Truck	4	6	5	4	2	2	18	41	5.9
Total	86	78	94	69	137	73	192	729	104.2

Condition of Road:—(Toll Road). Stone road, in good shape.
Remarks:—The officer taking census says that farmers are busy at harvest and that traffic in fall months is about two-thirds more than in July and August; also a large number of farmers use road before 7 a.m. and do not return till after 7 p.m.

METCALFE ROAD—Station No. 12—South Gloucester P.O.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fair	Thur. Fair	Fri. Cloudy	Sat. Cloudy	Sun. Cloudy	Mon. Fair	Total	Daily Average
One horse light vehicle.....	26	29	35	45	45	86	172	438	62.6
One horse heavy vehicle....	8	9	11	16	36	.....	68	148	21.1
Two horse light vehicle.....	11	5	9	5	11	15	39	95	13.6
Two horse heavy vehicle....	18	24	44	60	46	.....	34	226	32.3
Runabout	.....	.....	.....	.....	.....	.....	.....	.....	.....
Touring Car	13	18	30	24	36	37	86	244	34.9
Motor Truck	2	7	4	2	2	.....	31	48	6.8
Total	78	92	133	152	176	138	430	1,199	171.3

Condition of Road:—(Toll Road for 10 miles from city limits). Stone road, in good condition.

RUSSELL ROAD—Station No. 13—Toll House, Cumming's Bridge.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Cloudy	Thur. Fine	Fri. Cloudy	Sat. Fine	Sun. Rain	Mon. Fine	Total	Daily Average
One horse light vehicle.....	45	31	24	41	62	31	39	273	39.0
One horse heavy vehicle....	14	12	4	19	8	.....	14	71	10.1
Two horse light vehicle.....	5	6	6	2	1	.....	2	22	3.1
Two horse heavy vehicle....	25	30	3	13	7	.....	4	82	11.7
Runabout	2	6	1	2	2	.....	1	14	2.0
Touring Car	8	13	1	9	10	13	12	66	9.4
Motor Truck	4	1	2	2	1	3	2	15	2.2
Total	103	99	41	88	91	47	74	543	77.5

Condition of Road:—(Toll Road for 4½ miles). Stone road, in good conditions to end of Toll Road; the remainder in poor condition.
Remarks:—Hurdman's Bridge (1 mile south of Cumming's Bridge) diverts a considerable amount of traffic from this road. On visit for selection of stations this bridge was closed, but was opened during the taking of the census.

RUSSELL ROAD—Station No. 14—Ramsayville.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Cloudy	Sun. Fair	Mon. Fair	Total	Daily Average
One horse light vehicle.....	36	28	32	48	43	57	27	271	38.7
One horse heavy vehicle....	29	22	37	16	67	3	20	194	27.7
Two horse light vehicle.....	16	4	13	4	23	.....	8	68	9.7
Two horse heavy vehicle....	30	23	19	14	10	.....	10	106	15.1
Runabout	1	3	1	2	3	1	2	13	1.9
Touring Car	14	10	11	8	14	26	8	91	13.0
Motor Truck	2	2	2	2	.....	2	2	12	1.7
Total	128	92	115	94	160	89	77	755	107.8

Condition of Road:—Stone road, in poor shape from end of Toll Road eastwards.

MONTREAL ROAD—Station No. 13—Toll House, at Cumming's Bridge.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Cloudy	Thur. Fine	Fri. Cloudy	Sat. Fair	Sun. Rain	Mon. Fine	Total	Daily Average
One horse light vehicle.....	376	299	441	317	466	184	259	2,342	334.6
One horse heavy vehicle....	39	124	126	139	147	9	121	705	100.7
Two horse light vehicle.....	82	25	55	5	40	15	12	234	33.4
Two horse heavy vehicle....	63	142	182	143	127	9	71	737	105.3
Runabout	13	15	25	18	18	16	9	114	16.3
Touring Car	35	32	54	50	47	65	63	346	49.4
Motor Truck	16	8	14	10	5	35	3	91	13.0
Total	624	645	897	682	850	333	538	4,569	652.7

Condition of Road:—(Toll Road for 9½ miles). Stone road, in good condition; surface for 1 mile treated with tar.
Remarks:—The heavy two-horse vehicle traffic is to and from stone quarries, and also from gravel pits on Cyrville Road. Traffic from gravel pits uses road for 1½ miles, and traffic from stone quarries uses road for 3½ miles.

MONTREAL ROAD—Station No. 15—Quarries P.O.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Shwrs	Sun. Fine	Mon. Fine	Total	Daily Average
One horse light vehicle.....	35	39	44	47	79	75	52	371	53.0
One horse heavy vehicle....	24	17	38	29	83	35	20	246	35.1
Two horse light vehicle.....	5	4	14	2	12	4	4	45	6.4
Two horse heavy vehicle....	52	51	82	74	109	4	82	454	64.9
Runabout	4	2	6	7	14	20	8	61	8.7
Touring Car	11	14	28	30	41	50	38	212	30.3
Motor Truck	6	6	8	2	6	2	2	32	4.6
Total	137	133	220	191	344	190	206	1,421	203.0

Condition of Road:—(Toll Road). Stone road, in good condition.
Remarks:—The heavy two-horse vehicle traffic is to and from stone quarries situated east of station.

MONTREAL ROAD—Station No. 16—East of Village of St. Joseph.

Monday, July 27, to Sunday, August 2, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Cloudy	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Cloudy	Sun. Rain	Total	Daily Average
One horse light vehicle.....	41	27	24	32	31	51	155	361	51.5
One horse heavy vehicle....	22	16	10	20	19	24	.....	111	15.9
Two horse light vehicle.....	2	4	4	.....	2	1	6	19	2.7
Two horse heavy vehicle....	17	17	16	22	19	7	.....	98	14.0
Runabout	2	.....	1	.....	2	4	.....	9	1.2
Touring Car	15	6	9	15	8	6	16	75	10.8
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	99	70	64	89	81	93	177	673	96.1

Condition of Road:—(Toll Road). Stone road, in good condition.

Hamilton.

Census was taken from Sunday, August 16, to Saturday, August 22, inclusive. The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Plains Road (*Toronto-Hamilton*)	2	¼ and 5 miles.
2	Waterdown Road	1	4 miles.
3	Town Line Road	2	¼ and 5½ miles.
4	Dundas Road	1	3 miles.
5	Ancaster Road	2	3 and 7 miles.
6	Governor's Road	1	6 miles.
7	Waterloo Road	1	7 miles.
8	Brock Road	1	7 miles.
9	Caledonia Road	2	1½ and 5½ miles.
10	Mount Albion Road (*Elfrida Road*)	2	2½ and 8 miles.
11	Grimsby Stone Road	2	1 and 9 miles.
12	Beach Road	1	1 mile.
		18 (represented by 15 stations on map).	

Within the traffic area are several railway shipping points, viz., Dundas, Waterdown, Stoney Creek, Winona and Ancaster. These cause a certain amount of local traffic.

Adjacent to the city there are numerous stone quarries and brick works, which cause excessive traffic on some of the roads for a distance of one to two miles from the city limits. This is shown on the schedules under Stations 10, 14 and 15, on Caledonia Road, Grimsby Road and Beach Road.

The Grimsby Stone Road carries the heaviest motor traffic, a large percentage of this being through traffic, as this road is the main highway between Hamilton and Niagara Falls, and being a fairly good road almost the entire length is used a great deal throughout the spring, summer and fall months.

The roads around the city, all of which are built of stone, are in fairly good condition, with the exception of the above-mentioned roads carrying traffic from quarries.

PLAINS ROAD—Station No. 1—Junction of Town Line Road.

Including traffic from Town Line Road.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fair	Mon. Fine	Tues. Fair	Wed. Rain	Thur. Rain	Fri. Fine	Sat. Fine	Total	Daily Average
One horse light vehicle	177	152	138	110	92	128	263	1,060	151.4
One horse heavy vehicle	28	146	177	148	149	221	286	1,155	165.0
Two horse light vehicle	14	.....	3	1	6	.....	37	61	8.7
Two horse heavy vehicle	21	153	196	164	194	218	185	1,131	161.6
Runabout	64	39	16	14	17	22	29	201	28.7
Touring Car	205	193	153	148	108	137	217	1,161	165.9
Motor Truck	11	6	6	6	3	7	13	52	7.4
Total	520	689	689	591	569	733	1,030	4,821	688.7

Condition of Road:—Stone road, solid but rough.

To Galt
Waterloo Road
Brock Road
To Guelph
Town Line
To Paris
Governors Road
5.
Bullocks Corners
6.
4.
Dundas
Waterdown Street
To Toronto
3.
To Brantford
Ancaster Road
Ancaster
8.
7.
Dundas Road
Waterdown Rd.
1
Plains Road
2
To Toronto
Burlington
HAMILTON
10. Road
9. Caledonia
North Glanford
Mt Albion Road
11.
Elfrida Road
Bartonville
14
Grimsby
Beach Rd
15.
Stoney Creek
Stone Road
To St Catharines
12.
Elfrida
13.
Fruitland
Scale of miles

PLAINS ROAD—Station No. 1—Junction of Town Line Road.

Excluding traffic from Town Line Road.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fair	Mon. Fine	Tues. Fair	Wed. Rain	Thur. Rain	Fri. Fine	Sat. Fine	Total	Daily Average
One horse light vehicle.....	121	108	87	88	52	89	173	718	102.5
One horse heavy vehicle....	17	117	117	117	88	158	190	804	114.9
Two horse light vehicle.....	3	.....	3	1	6	.....	24	37	5.3
Two horse heavy vehicle....	5	100	112	116	115	162	130	740	105.7
Runabout	49	35	12	9	11	17	22	155	22.1
Touring Car	171	149	129	113	73	111	195	941	134.5
Motor Truck	10	6	5	4	2	5	11	43	6.1
Total	376	515	465	448	347	542	745	3,438	491.1

Condition of Road:—Stone road, very rough.
Remarks:—The extra heavy two-horse vehicle traffic is from sand and gravel pits located east of station; there is also a large farming traffic.

PLAINS ROAD—Station No. 2—Boundary Line of Wentworth County.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fair	Mon. Fair	Tues. Cloudy	Wed. Cloudy	Thur. Rain	Fri. Fair	Sat. Fair	Total	Daily Average
One horse light vehicle.....	40	23	29	40	13	35	33	213	30.4
One horse heavy vehicle....	7	79	70	57	32	63	68	376	53.7
Two horse light vehicle.....	.....	1	1	.....	.....	.....	.....	2	0.3
Two horse heavy vehicle....	1	36	30	45	26	48	36	222	31.7
Runabout	18	17	16	5	14	12	28	110	15.7
Touring Car	160	96	73	60	44	68	127	628	89.7
Motor Truck	.....	3	3	3	3	3	6	21	3.0
Total	226	255	222	210	132	229	298	1,572	224.5

Condition of Road:—Stone road, very rough and badly cut up in places.

WATERDOWN ROAD—Station No. 3—Junction of Dundas Street.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fair	Mon Fair	Tues. Rain	Wed. Rain	Thur. Rain	Fri. Cloudy	Sat. Fair	Total	Daily Average
One horse light vehicle.....	39	34	32	48	30	26	64	273	39.0
One horse heavy vehicle....	1	16	11	20	29	23	35	135	19.2
Two horse light vehicle.....	4	4	11	1	6	4	16	46	6.8
Two horse heavy vehicle....	2	19	20	19	33	32	34	159	22.7
Runabout	9	9	2	6	1	2	5	34	4.8
Touring Car	15	20	13	8	4	12	27	99	14.1
Motor Truck	.....	4	5	2	4	1	.....	16	2.2
Total	70	106	94	104	107	100	181	762	108.8

Condition of Road:—Stone road, in fair condition.

TOWN LINE ROAD—Station No. 1—Junction of Plains Road.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fair	Mon. Fine	Tues. Fair	Wed. Rain	Thur. Rain	Fri. Fine	Sat. Fine	Total	Daily Average
One horse light vehicle.....	56	44	51	22	40	39	90	342	48.9
One horse heavy vehicle....	11	29	60	31	61	63	96	351	50.1
Two horse light vehicle.....	11	.....	.....	.....	.....	.....	13	24	3.4
Two horse heavy vehicle....	16	53	84	48	79	56	55	391	55.9
Runabout	15	4	4	5	6	5	7	46	6.6
Touring Car	34	44	24	35	35	26	22	220	31.4
Motor Truck	1	.....	1	2	1	2	2	9	1.3
Total	144	174	224	143	222	191	285	1,383	197.6

Condition of Road:—Stone road, very rough but solid.
Remarks:—The heavy traffic is from brick works situated near by.

TOWN LINE ROAD—Station No. 4—Junction of IV. Concession Road.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fair	Mon. Fair	Tues. Cloudy	Wed. Rain	Thur. Rain	Fri. Fair	Sat. Fine	Total	Daily Average
One horse light vehicle.....	41	43	48	32	33	43	53	293	41.8
One horse heavy vehicle....	2	16	30	19	26	29	69	191	27.2
Two horse light vehicle.....	.....	3	5	2	1	3	4	18	2.5
Two horse heavy vehicle....	2	29	43	41	30	45	55	245	35.0
Runabout	6	3	2	4	3	1	4	23	3.2
Touring Car	38	44	16	29	12	21	53	213	30.7
Motor Truck	1	.....	.....	1	.....	1	.....	3	0.4
Total	90	138	144	128	105	143	238	986	140.8

Condition of Road:—Stone road, in fair condition.

DUNDAS ROAD—Station No. 7—Junction of Ancaster Road.

Including traffic from Ancaster Road.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fair	Mon. Fair	Tues. Cloudy	Wed. Cloudy	Thur. Rain	Fri. Fair	Sat. Fair	Total	Daily Average
One horse light vehicle.....	110	109	107	122	55	114	150	767	109.5
One horse heavy vehicle....	2	87	135	99	82	126	177	708	101.1
Two horse light vehicle.....	3	5	3	14	1	5	3	34	4.9
Two horse heavy vehicle....	14	133	109	100	97	153	131	737	105.3
Runabout	24	41	25	28	23	25	35	201	28.7
Touring Car	173	152	101	114	68	101	157	866	123.7
Motor Truck	2	12	20	11	6	8	13	72	10.3
Total	328	539	500	488	332	532	666	3,385	483.5

Condition of Road:—Stone road, in good condition considering the heavy traffic.

DUNDAS ROAD—Station No. 7—Junction of Ancaster Road.

Excluding traffic from Ancaster Road.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fair	Mon. Fair	Tues. Cloudy	Wed. Cloudy	Thur. Rain	Fri. Fair	Sat. Fair	Total	Daily Average
One horse light vehicle.....	67	58	67	65	32	59	52	400	57.1
One horse heavy vehicle....	2	53	86	56	54	75	69	395	56.4
Two horse light vehicle.....	3	3	2	8	.....	4	.....	20	2.9
Two horse heavy vehicle....	14	58	56	60	60	60	55	363	51.9
Runabout	14	23	17	14	17	13	10	108	15.4
Touring Car	98	82	58	55	35	63	55	446	63.7
Motor Truck	.....	10	10	10	6	6	3	45	6.4
Total	198	287	296	268	204	280	244	1,777	253.8

Condition of Road:—Stone road, in good condition.
Remarks:—The majority of traffic is to and from town of Dundas, 2½ miles west of station.

ANCASTER ROAD—Station No. 7—Junction of Dundas Road.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fair	Mon. Fair	Tues. Cloudy	Wed. Cloudy	Thur. Rain	Fri. Fair	Sat. Fair	Total	Daily Average
One horse light vehicle.....	43	51	40	57	23	55	88	367	52.4
One horse heavy vehicle.....	.....	34	49	43	28	51	108	313	44.7
Two horse light vehicle.....	.....	2	1	6	1	1	3	14	2.0
Two horse heavy vehicle.....	.....	75	53	40	37	93	76	374	53.4
Runabout	10	18	8	14	6	12	25	93	13.3
Touring Car	75	70	43	59	33	38	102	420	60.0
Motor Truck	2	2	10	1	.....	2	10	27	3.9
Total	130	252	204	220	128	252	422	1,608	229.7

Condition of Road:—Stone road, in good condition.
Remarks:—There is heavy traffic to and from lime kilns, a little west of station.

ANCASTER ROAD—Station No. 8—Ancaster P.O.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Cloudy	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Fine	Total	Daily Average
One horse light vehicle.....	72	106	104	124	66	143	138	753	107.5
One horse heavy vehicle.....	.....	.....	5	17	4	11	9	46	6.5
Two horse light vehicle.....	3	22	40	19	14	19	29	146	20.8
Two horse heavy vehicle.....	.....	60	33	36	23	55	56	263	37.5
Runabout	8	13	6	10	2	6	16	61	8.7
Touring Car	91	79	42	43	31	47	49	382	54.9
Motor Truck	2	2	.....	2	.....	.....	3	9	1.2
Total	176	282	230	251	140	281	300	1,660	237.1

Condition of Road:—Stone road, in good condition.

GOVERNOR'S ROAD—Station No. 6—Lot 40, Concession 1, Ancaster Township.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fair	Mon. Fine	Tues. Rain	Wed. Cloudy	Thur. Rain	Fri. Fair	Sat. Fair	Total	Daily Average
One horse light vehicle.....	33	43	36	33	32	31	43	251	35.8
One horse heavy vehicle.....	.....	6	4	2	.....	.....	10	22	3.4
Two horse light vehicle.....	.....	.....	7	3	4	4	9	27	3.8
Two horse heavy vehicle.....	2	12	7	4	8	25	8	66	9.4
Runabout	2	1	2	.....	.....	1	.....	6	0.8
Touring Car	13	9	4	5	2	4	17	54	7.7
Motor Truck	2	.....	.....	.....	.....	.....	2	4	0.5
Total	52	71	60	47	46	65	89	430	61.4

Condition of Road:—Stone road, good in parts.

WATERLOO ROAD—Station No. 5—Junction of Brock Road (Bullock's Corners.)

Including traffic from Brock Road.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Rain	Mon. Fine	Tues. Cloudy	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Fine	Total	Daily Average
One horse light vehicle.....	126	142	145	133	77	165	243	1,031	147.3
One horse heavy vehicle.....	.....	14	8	10	17	19	20	88	12.6
Two horse light vehicle.....	1	14	13	12	19	26	56	138	19.7
Two horse heavy vehicle.....	12	56	58	54	34	45	47	306	43.7
Runabout	57	16	3	2	4	5	12	99	14.2
Touring Car	43	39	28	32	14	28	64	248	35.4
Motor Truck	.....	4	3	2	2	2	2	15	2.1
Total	239	285	258	245	167	290	441	1,925	275.0

Condition of Road:—Stone road, in fair condition.

WATERLOO ROAD—Station No. 5—Junction of Brock Road (Bullock's Corners).

Excluding traffic from Brock Road.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Rain	Mon. Fine	Tues. Cloudy	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Fine	Total	Daily Average
One horse light vehicle.....	49	56	60	46	27	60	107	405	57.9
One horse heavy vehicle.....	.....	5	4	5	7	7	6	34	4.9
Two horse light vehicle.....	1	11	9	1	11	11	20	64	9.1
Two horse heavy vehicle.....	7	22	26	24	20	8	14	121	17.3
Runabout	41	7	1	.....	2	4	7	62	8.9
Touring Car	38	25	22	18	12	21	45	181	25.8
Motor Truck	.....	4	3	1	2	2	2	14	2.0
Total	136	130	125	95	81	113	201	881	125.9

Condition of Road:—Stone road, in good condition.

BROCK ROAD—Station No. 5—Junction of Waterloo Road (Bullock's Corners).

Excluding traffic from Waterloo Road.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Rain	Mon. Fine	Tues. Cloudy	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Fine	Total	Daily Average
One horse light vehicle	77	86	85	87	50	105	136	626	89.4
One horse heavy vehicle	.....	9	4	5	10	12	14	54	7.7
Two horse light vehicle	.....	3	4	11	8	15	33	74	10.6
Two horse heavy vehicle	5	34	32	30	14	37	33	185	26.4
Runabout	16	9	2	2	2	1	5	37	5.3
Touring Car	5	14	6	14	2	7	19	67	9.6
Motor Truck	.....	.....	.....	1	.....	.....	.....	1	0.1
Total	103	155	133	150	86	177	240	1,044	149.1

Condition of Road:—Stone road, in fair condition.

CALEDONIA ROAD—Station No. 10—Junction of VI. Concession Road.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fair	Mon. Cloudy	Tues. Rain	Wed. Rain	Thur. Rain	Fri. Fair	Sat. Fair	Total	Daily Average
One horse light vehicle	83	73	84	82	74	91	189	676	96.5
One horse heavy vehicle	8	44	42	34	40	48	64	280	40.0
Two horse light vehicle	6	14	24	18	20	30	48	160	22.8
Two horse heavy vehicle	8	83	91	89	37	127	135	570	81.4
Runabout	3	4	.....	2	2	2	5	18	2.8
Touring Car	63	65	23	24	16	26	47	264	37.7
Motor Truck	.....	2	.....	2	2	.....	4	10	1.4
Total	171	285	264	251	191	324	492	1,978	282.6

Condition of Road:—Stone road, in fair condition.
Remarks:—Heavy two-horse vehicle traffic is from stone quarries located near by.

CALEDONIA ROAD—Station No. 9.—North Glanford.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Cloudy	Mon. Fair	Tues. Shwry	Wed. Strmy	Thur. Rain	Fri. Fair	Sat. Fair	Total	Daily Average
One horse light vehicle	87	58	55	67	56	64	112	499	71.5
One horse heavy vehicle	.....	5	9	2	8	6	5	35	5.0
Two horse light vehicle	2	6	19	4	7	36	23	97	13.8
Two horse heavy vehicle	8	37	50	30	19	66	92	302	43.1
Runabout	3	3	.....	.....	.....	1	5	12	1.7
Touring Car	46	32	12	10	6	12	44	162	23.1
Motor Truck	.....	1	.....	2	.....	.....	1	4	0.5
Total	146	142	145	115	96	185	282	1,111	158.7

Condition of Road:—Stone road, in fair condition.

MOUNT ALBION ROAD (ELFRIDA ROAD)—Station No. 11—Junction of Road to Mount Albion Railway Station.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fair	Mon. Cloudy	Tues. Cloudy	Wed. Rain	Thur. Rain	Fri. Fair	Sat. Fair	Total	Daily Average
One horse light vehicle	34	43	63	57	52	45	150	444	63.4
One horse heavy vehicle	1	2	.....	3	4	8	10	28	4.0
Two horse light vehicle	.....	3	9	17	24	8	57	118	16.9
Two horse heavy vehicle	2	12	34	24	32	60	42	206	29.6
Runabout	.....	.....	2	2	.....	.....	2	6	0.8
Touring Car	15	11	11	4	5	8	14	68	9.7
Motor Truck	.....	.....	2	.....	.....	.....	.....	2	0.2
Total	52	71	121	107	117	129	275	872	124.6

Condition of Road:—Stone road, in fair condition.

MOUNT ALBION ROAD (ELFRIDA ROAD)—Station 12—Elfrida.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fair	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Rain	Fri. Fair	Sat. Fair	Total	Daily Average
One horse light vehicle	17	33	26	21	18	35	34	184	26.4
One horse heavy vehicle	.....	1	5	1	6	14	7	34	4.8
Two horse light vehicle	4	4	3	5	10	5	18	49	7.0
Two horse heavy vehicle	1	24	26	29	32	72	52	236	33.7
Runabout	.....	.....	.....	.....	.....	.....	.....	.....	.....
Touring Car	13	4	6	3	3	5	9	43	6.1
Motor Truck	.....	.....	1	1	1	.....	.....	3	0.4
Total	35	66	67	60	70	131	120	549	78.4

Condition of Road:—Stone road, in good condition.

GRIMSBY STONE ROAD—Station No. 14—Bartonville.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fair	Mon. Fine	Tues. Fair	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Fine	Total	Daily Average
One horse light vehicle	43	53	61	49	24	53	77	360	51.4
One horse heavy vehicle	2	96	90	84	65	111	106	554	79.1
Two horse light vehicle	2	18	7	11	5	19	18	80	11.4
Two horse heavy vehicle	3	283	233	196	65	145	169	1,094	156.4
Runabout	16	18	18	17	6	17	20	112	16.0
Touring Car	154	121	91	85	47	91	164	753	107.5
Motor Truck	.....	14	4	1	4	3	9	35	5.0
Total	220	603	504	443	216	439	563	2,988	426.8

Condition of Road:—Stone road, very rough and badly worn.
Remarks:—The excessive heavy two-horse heavy vehicle traffic is from stone quarries situated near by.

GRIMSBY STONE ROAD—Station No. 13—Fruitland.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Fine	Mon. Fair	Tues. Cloudy	Wed. Rain	Thur. Rain	Fri. Fair	Sat. Fine	Total	Daily Average
One horse light vehicle.....	34	19	7	21	16	20	22	139	19.8
One horse heavy vehicle....	1	30	31	30	11	39	35	177	25.2
Two horse light vehicle.....	2	2	2	.....	.....	1	1	8	1.1
Two horse heavy vehicle....	1	44	23	34	12	38	44	206	29.8
Runabout	18	14	9	22	7	10	10	90	12.8
Touring Car	180	115	88	72	51	60	126	692	98.8
Motor Truck	.....	.....	.....	1	4	1	5	11	1.5
Total	236	224	160	180	101	169	253	1,323	189.0

Condition of Road:—Stone road, in fair condition.

BEACH ROAD—Station No. 15—Junction of Road to Bartonville.

Sunday, August 16, to Saturday, August 22, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Cloudy	Mon. Fine	Tues. Cloudy	Wed. Cloudy	Thur. Rain	Fri. Cloudy	Sat. Fine	Total	Daily Average
One horse light vehicle.....	34	31	24	15	5	14	35	158	22.5
One horse heavy vehicle....	2	30	47	44	43	36	40	242	34.8
Two horse light vehicle.....	3	4	4	6	1	5	11	34	4.8
Two horse heavy vehicle....	1	95	112	126	66	182	179	761	108.7
Runabout	8	15	15	18	8	14	21	99	14.1
Touring Car	91	93	80	80	45	59	127	575	82.1
Motor Truck	.....	3	4	3	5	3	5	23	3.2
Total	139	271	286	292	173	313	418	1,892	270.2

Condition of road:—Stone road, solid but very rough.
Remarks:—Heavy teaming to and from beach for gravel.

London.

Census was taken from Thursday, August 6, to Wednesday, August 12, inclusive.

The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Governor's Road	3	3½, 6 and 9 miles.
2	Hamilton Road	2	3½ and 6 miles.
3	Wellington Road	2	2½ and 7 miles.
4	Longwoods Road	3	3, 5 and 9 miles.
5	North Branch of Talbot Road	2	5 and 8 miles.
6	Pipe Line Road	1	2 miles.
7	River Road	1	3½ miles.
8	Sarnia Road	3	2½, 5 and 8 miles.
9	Proof Line Road	3	2½, 6 and 9 miles.
10	Adelaide Street	2	3 and 5 miles.
		22 (represented by 21 stations on map).	

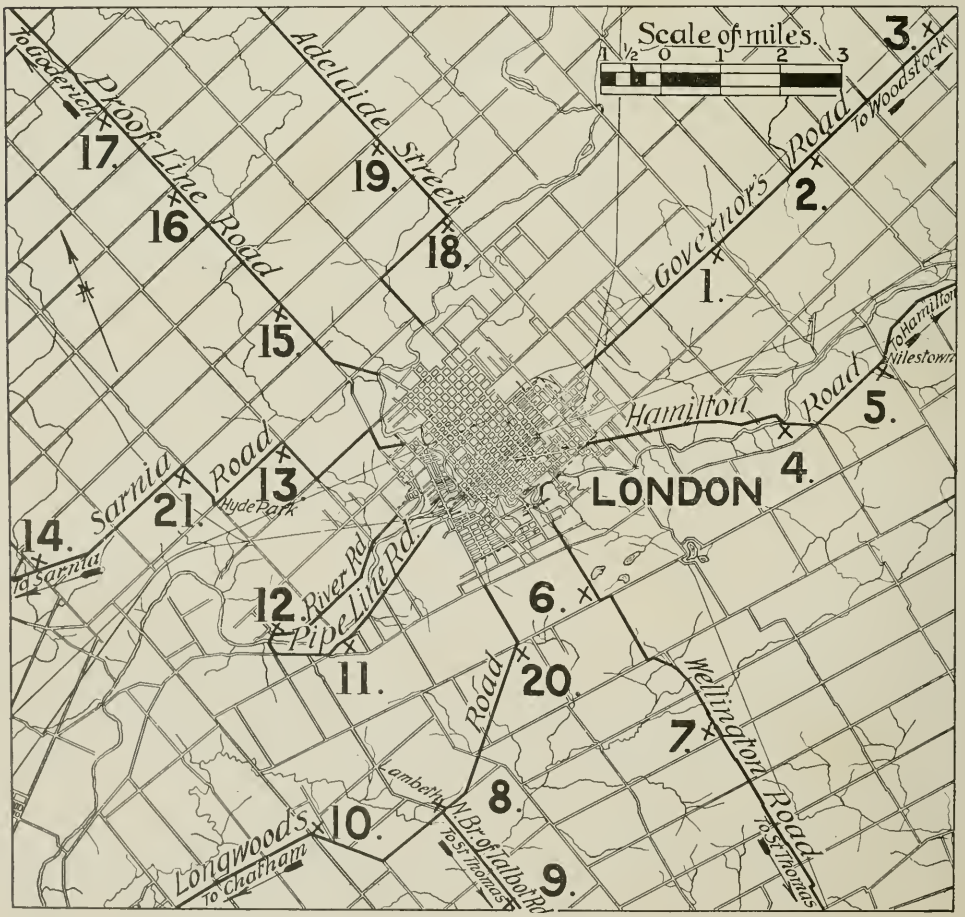
A suburban electric railway runs as far as Lambeth, a distance of about 5½ miles from the city limits, on Longwoods Road, thence south on Talbot Road to St. Thomas; this line is used a great deal by farmers coming to market; also the city street railway runs to Byron, parallel to Pipe Line Road for about 3½ miles from the city limits.

There are several shipping and market centres within the traffic area, viz.:— Ilderton, Dorchester, Glamworth, and Lambeth. These cause a certain amount of local traffic on the roads.

During the taking of the census, a bridge on the Sarnia Road near Ferguson was being constructed; the diversion of traffic thus caused accounts for the comparatively small number of motors using the road at Station 21.

Near Station 12 (River Road) is a pleasure park which is used a great deal by city people.

The roads adjacent to the city are built of gravel and are in fair condition.



GOVERNOR'S ROAD—Station No. 1—Crumlin.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fine	Mon. Cloudy	Tues. Cloudy	Wed. Fine	Total	Daily Average
One horse light vehicle.....	85	37	60	47	46	62	65	402	57.4
One horse heavy vehicle....	28	24	43	9	39	41	36	220	31.4
Two horse light vehicle.....	.....	3	7	.....	7	.....	11	28	4.0
Two horse heavy vehicle....	9	19	27	.....	19	33	24	131	18.7
Runabout	9	14	17	13	14	11	17	95	13.6
Touring Car	77	60	58	103	51	83	76	508	72.6
Motor Truck	.....	1	5	.....	2	.....	4	12	1.7
Total	208	158	217	172	178	230	233	1,396	199.4

Condition of Road:—Gravel road, in fair condition.

GOVERNOR'S ROAD—Station No. 2—McWilliams (Lot 6, Concession 1, Dorchester N. Township).

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fine	Fri. Fine	Sat. Fair	Sun. Fair	Mon. Rain	Tues. Fair	Wed. Fair	Total	Daily Average
One horse light vehicle.....	43	19	29	47	13	31	19	201	28.7
One horse heavy vehicle....	12	8	11	10	10	13	11	75	10.7
Two horse light vehicle.....	.....	6	1	.....	3	3	5	18	2.5
Two horse heavy vehicle....	4	6	7	.....	2	12	12	43	6.1
Runabout	11	15	10	28	16	9	19	108	15.6
Touring Car	52	57	40	73	39	56	38	355	50.7
Motor Truck	.....	1	1	.....	1	1	1	5	0.7
Total	122	112	99	158	84	125	105	805	115.0

Condition of Road:—Gravel road, in fair condition.

GOVERNOR'S ROAD—Station No. 3—Lot 14, Concession 1, Dorchester N. Township.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Cloudy	Mon. Rain	Tues. Fair	Wed. Fair	Total	Daily Average
One horse light vehicle.....	37	23	26	33	9	18	25	171	24.4
One horse heavy vehicle....	11	4	8	9	3	.....	5	40	5.7
Two horse light vehicle.....	.....	3	.....	2	2	.....	2	9	1.3
Two horse heavy vehicle....	4	3	5	13	3	.....	18	46	6.6
Runabout	11	16	12	9	12	23	21	104	14.9
Touring Car	75	67	36	75	40	84	56	433	61.9
Motor Truck	.....	.....	.....	.....	.....	1	.....	1	0.1
Total	138	116	87	141	69	126	127	804	114.9

Condition of Road:—Gravel road, in fair condition.

HAMILTON ROAD—Station No. 4—Lot 9, B.F. Westminster Township.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Rain	Tues. Cloudy	Wed. Fair	Total	Daily Average
One horse light vehicle.....	39	26	35	22	22	20	22	186	26.5
One horse heavy vehicle....	15	19	13	10	26	21	28	132	18.9
Two horse light vehicle.....	10	7	8	3	5	4	3	40	5.7
Two horse heavy vehicle....	14	16	21	.....	22	33	26	132	18.9
Runabout	4	8	1	11	5	4	7	40	5.7
Touring Car	23	14	17	27	11	22	16	130	18.6
Motor Truck	2	.....	1	.....	.....	3	.....	6	0.8
Total	107	90	96	73	91	107	102	666	95.1

Condition of Road:—Gravel road, in fair condition.

HAMILTON ROAD—Station No. 5—Nilestown.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fine	Fri. Fine	Sat. Warm	Sun. Fine	Mon. Fair	Tues. Fine	Wed. Fine	Total	Daily Average
One horse light vehicle.....	29	16	19	22	25	27	22	160	22.8
One horse heavy vehicle....	8	10	8	4	10	10	13	63	9.0
Two horse light vehicle.....	8	3	6	1	3	3	2	26	3.7
Two horse heavy vehicle....	5	3	4	.....	10	6	8	36	5.1
Runabout	3	9	1	4	4	8	4	33	4.7
Touring Car	21	17	16	30	8	19	13	124	17.7
Motor Truck	2	.....	2	1	.....	4	.....	9	1.4
Total	76	58	56	62	60	77	62	451	64.4

Condition of Road:—Gravel road, in fair condition.

WELLINGTON ROAD—Station No. 6—Lot 25, Concession II, Westminster Township.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fine	Fri. Fair	Sat. Fine	Sun. Fine	Mon. Fair	Tues. Fair	Wed. Fine	Total	Daily Average
One horse light vehicle.....	36	38	80	27	40	50	40	311	44.4
One horse heavy vehicle....	19	20	46	6	28	38	28	185	26.4
Two horse light vehicle.....	5	3	2	.....	3	4	4	21	3.0
Two horse heavy vehicle....	14	9	6	.....	24	34	24	111	15.8
Runabout	14	4	7	8	3	6	6	48	6.8
Touring Car	48	34	35	46	18	34	40	255	36.4
Motor Truck	3	3	2	1	1	.....	.....	10	1.6
Total	139	111	178	88	117	166	142	941	134.4

Condition of Road:—Gravel road, in good condition.

WELLINGTON ROAD—Station No. 7—Junction of V. Concession Road.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fine	Mon. Shwrs	Tues. Fair	Wed. Cloudy	Total	Daily Average
One horse light vehicle.....	27	32	49	17	33	29	38	225	32.1
One horse heavy vehicle....	9	13	20	.....	10	12	15	79	11.2
Two horse light vehicle.....	2	1	4	.....	4	7	5	23	3.5
Two horse heavy vehicle....	6	6	2	.....	21	3	31	69	9.8
Runabout	6	3	4	2	1	3	.....	19	2.7
Touring Car	62	35	36	55	22	51	39	300	42.8
Motor Truck	4	1	2	.....	.....	.....	.....	7	1.0
Total	116	91	117	74	91	105	128	722	103.1

Condition of Road:—Gravel road, in fair condition.

LONGWOODS ROAD—Station No. 20—Lot 32, Concession II, Westminster Township.

Saturday, August 8, to Friday, August 14, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fair	Sun. Fair	Mon. Rain	Tues. Fine	Wed. Fair	Thur. Rain	Fri. Fair	Total	Daily Average
One horse light vehicle.....	69	27	21	58	34	25	19	253	36.1
One horse heavy vehicle....	124	14	43	75	30	69	32	387	55.3
Two horse light vehicle.....	.....	1	4	10	3	8	5	31	4.4
Two horse heavy vehicle ...	26	.....	22	59	30	22	26	185	26.4
Runabout	17	42	12	11	9	12	15	118	16.9
Touring Car	50	84	49	68	59	61	53	424	60.6
Motor Truck	3	.....	3	6	.....	2	4	18	2.6
Total	289	168	154	287	165	199	154	1,416	202.3

Condition of Road:—Gravel road, in good condition.

LONGWOODS ROAD—Station No. 8—Lambeth (Junction of North Branch of Talbot Road).

Including traffic from North Branch of Talbot Road.

Saturday, August 8, to Friday, August 14, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fair	Sun. Fair	Mon. Rain	Tues. Fair	Wed. Fair	Thur. Rain	Fri. Fair	Total	Daily Average
One horse light vehicle.....	78	25	67	75	71	58	72	446	63.8
One horse heavy vehicle....	96	6	59	62	52	78	65	418	59.7
Two horse light vehicle.....	12	1	12	12	12	8	16	73	10.4
Two horse heavy vehicle ...	28	.....	39	53	29	21	36	206	29.4
Runabout	12	11	10	8	8	9	14	72	10.2
Touring Car	75	103	59	65	75	68	70	515	73.6
Motor Truck	4	.....	.....	3	3	5	11	26	3.7
Total	305	146	246	278	250	247	284	1,756	250.8

Condition of Road:—Gravel road, in fair condition.

LONGWOODS ROAD—Station No. 8—Lambeth (Junction of North Branch of Talbot Road).

Excluding traffic from North Branch of Talbot Road.

Saturday, August 8, to Friday, August 14, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fair	Sun. Fair	Mon. Rain	Tues. Fair	Wed. Fair	Thur. Rain	Fri. Fair	Total	Daily Average
One horse light vehicle.....	47	9	30	35	31	34	35	221	31.6
One horse heavy vehicle....	52	2	27	23	25	37	25	191	27.3
Two horse light vehicle.....	9	1	4	8	3	5	8	38	5.4
Two horse heavy vehicle	13	.....	18	18	11	7	11	78	11.1
Runabout	6	4	8	2	3	8	5	36	5.1
Touring Car	42	35	22	35	31	32	31	228	32.6
Motor Truck	1	.....	.....	3	2	3	7	16	2.3
Total	170	51	109	124	106	126	122	808	115.4

Condition of Road:—Gravel road, in fair condition.

LONGWOODS ROAD—Station No. 10—Town Line between Westminster and Delaware.

Saturday, August 8, to Friday, August 14, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fine	Sun. Cloudy	Mon. Rain	Tues. Fair	Wed. Fine	Thur. Rain	Fri. Fine	Total	Daily Average
One horse light vehicle.....	26	38	29	44	33	10	26	206	29.4
One horse heavy vehicle....	20	3	12	12	22	10	11	90	12.9
Two horse light vehicle.....	7	4	11	12	1	1	3	39	5.6
Two horse heavy vehicle....	4	.....	6	4	6	6	1	27	3.9
Runabout	11	15	15	7	3	3	9	63	9.0
Touring Car	40	54	31	42	37	33	39	276	39.4
Motor Truck	1	.....	2	3	1	2	4	13	1.8
Total	109	114	106	124	103	65	93	714	102.0

Condition of Road:—Gravel road, in fair condition.

NORTH BRANCH OF TALBOT ROAD—Station No. 8—Lambeth (Junction of Longwoods Road).

Saturday, August 8, to Friday, August 14, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fair	Sun. Fair	Mon. Rain	Tues. Fair	Wed. Fair	Thur. Rain	Fri. Fair	Total	Daily Average
One horse light vehicle.....	31	16	37	40	40	24	37	225	32.2
One horse heavy vehicle....	44	4	32	39	27	41	40	227	32.4
Two horse light vehicle.....	3	.....	8	4	9	3	8	35	5.0
Two horse heavy vehicle....	15	.....	21	35	18	14	25	128	18.3
Runabout	6	7	2	6	5	1	9	36	5.1
Touring Car	33	68	37	30	44	36	39	287	41.0
Motor Truck	3	.....	.....	.....	1	2	4	10	1.4
Total	135	95	137	154	144	121	162	948	135.4

Condition of Road:—Gravel road, in good condition.

NORTH BRANCH OF TALBOT ROAD—Station No. 9—Scottsville.

Saturday, August 8, to Friday, August 14, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fine	Sun. Fine	Mon. Rain	Tues. Cloudy	Wed. Fine	Thur. Rain	Fri. Fine	Total	Daily Average
One horse light vehicle	19	22	18	17	22	19	23	140	20.0
One horse heavy vehicle	30	.....	26	18	14	11	15	114	16.3
Two horse light vehicle	.....	.....	1	1	1	2	5	10	1.4
Two horse heavy vehicle	18	.....	9	23	19	16	35	120	17.1
Runabout	6	6	5	8	5	8	10	48	6.9
Touring Car	34	52	23	22	32	26	18	207	29.6
Motor Truck	2	.....	.....	5	.....	.....	2	9	1.3
Total	109	80	82	94	93	82	108	648	92.6

Condition of Road:—Gravel road, in good condition.

PIPE LINE ROAD—Station No. 11—Lot 38, B.F. Westminster Township.

Friday, August 7, to Thursday, August 13, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Rain	Tues. Fair	Wed. Fair	Thur. Rain	Total	Daily Average
One horse light vehicle	27	39	40	18	18	30	7	179	25.6
One horse heavy vehicle	13	115	3	23	50	19	73	296	42.3
Two horse light vehicle	1	2	4	1	.....	6	.....	14	2.0
Two horse heavy vehicle	11	30	.....	9	19	7	10	86	12.3
Runabout	14	9	19	6	10	10	2	70	10.0
Touring Car	64	48	64	30	38	80	29	353	50.4
Motor Truck	5	.....	.....	4	5	5	3	22	3.1
Total	135	243	130	91	140	157	124	1,020	145.7

Condition of Road:—Gravel road, in fair condition.
Remarks:—This road is used a great deal after 7 p.m.

RIVER ROAD—Station No. 12—Lot 24, Concession I, London Township.

Friday, August 7, to Thursday, August 13, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Cloudy	Tues. Fair	Wed. Fair	Thur. Cloudy	Total	Daily Average
One horse light vehicle	9	11	19	11	14	16	13	93	13.2
One horse heavy vehicle	3	15	3	11	11	12	6	61	8.7
Two horse light vehicle	2	1	.....	1	.....	6	.....	10	1.4
Two horse heavy vehicle	4	2	.....	11	2	.....	7	26	3.7
Runabout	9	2	5	2	3	1	.....	22	3.4
Touring Car	19	19	31	9	10	31	4	123	17.5
Motor Truck	1	.....	.....	.....	.....	.....	.....	1	0.1
Total	47	50	58	45	40	66	30	336	48.0

Condition of Road:—Gravel road, in fair condition.

SARNIA ROAD—Station No. 13—East of Hyde Park (Lot 21, Concession III, London Township).

Friday, August 7, to Thursday, August 13, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Cloudy	Tues. Fair	Wed. Fair	Thur. Rain	Total	Daily Average
One horse light vehicle.....	30	68	32	38	63	32	58	321	45.8
One horse heavy vehicle....	18	19	2	17	9	12	6	83	11.8
Two horse light vehicle.....	.....	.....	1	2	3	.....	.....	6	0.8
Two horse heavy vehicle	11	28	.....	15	30	6	13	103	14.7
Runabout	3	7	5	2	8	5	2	32	4.5
Touring Car	15	26	25	17	48	33	13	177	25.5
Motor Truck	5	6	.....	6	3	2	6	28	4.0
Total	82	154	65	97	164	90	98	750	107.1

Condition of Road:—Gravel road, in good condition.

SARNIA ROAD—Station No. 21—North of Hyde Park (South Half of Lot 25, Concession V., London Township).

Friday, August 7, to Thursday, August 13, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fine	Sat. Fine	Sun. Fine	Mon. Cloudy	Tues. Fine	Wed. Fine	Thur. Rain	Total	Daily Average
One horse light vehicle.....	17	21	14	16	31	15	10	124	17.7
One horse heavy vehicle....	2	11	1	4	4	1	4	27	3.9
Two horse light vehicle.....	3	2	.....	2	3	.....	3	13	1.9
Two horse heavy vehicle	4	6	.....	2	5	2	3	22	3.1
Runabout	4	3	5	3	6	6	2	29	4.1
Touring Car	15	12	8	13	20	18	16	102	14.6
Motor Truck	1	.....	.....	1	.....	1	1	4	0.6
Total	46	55	28	41	69	43	39	321	45.9

Condition of Road:—Gravel road, in good condition.
Remarks:—West of station traffic is diverted from road on account of bridge being constructed. This would account for drop in traffic as compared with that at Station 14.

SARNIA ROAD—Station No. 14—Ferguson.

Friday, August 7, to Thursday, August 13, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Rain	Tues. Fair	Wed. Fair	Thur. Rain	Total	Daily Average
One horse light vehicle.....	37	33	40	50	51	41	37	289	41.3
One horse heavy vehicle....	1	8	.....	2	1	.....	.....	12	1.7
Two horse light vehicle.....	5	1	.....	5	3	6	3	23	3.3
Two horse heavy vehicle	11	10	.....	7	8	8	8	52	7.4
Runabout	5	3	5	4	7	7	3	34	4.8
Touring Car	21	17	13	15	22	19	17	124	17.7
Motor Truck	1	.....	.....	1	.....	1	1	4	0.6
Total	81	72	58	84	92	82	69	538	76.8

Condition of Road:—Gravel road, in good condition.

PROOF LINE ROAD—Station No. 15—North of Masonville (Lot 16, Concession V, London Township).

Friday, August 7, to Thursday, August 13, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fine	Sat. Fine	Sun. Fine	Mon. Rain	Tues. Fair	Wed. Fair	Thur. Rain	Total	Daily Average
One horse light vehicle.....	29	75	64	76	76	57	51	428	61.1
One horse heavy vehicle....	18	29	8	22	22	15	21	135	19.2
Two horse light vehicle.....	8	1	3	10	2	.....	.....	24	3.4
Two horse heavy vehicle ..	18	17	.....	27	28	33	18	141	20.1
Runabout	11	14	8	7	4	8	3	55	7.8
Touring Car	53	41	61	35	37	49	26	302	43.4
Motor Truck	.....	4	.....	2	3	4	2	15	2.1
Total	137	181	144	179	172	166	121	1,100	157.1

Condition of Road:—Gravel road, in good condition.

PROOF LINE ROAD—Station No. 16—North of Arva (Lot 16, Concession VIII, London Township).

Friday, August 7, to Thursday, August 13, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Fine	Sun. Fair	Mon. Rain	Tues. Fine	Wed. Fine	Thur. Rain	Total	Daily Average
One horse light vehicle.....	26	44	34	43	44	45	38	274	39.1
One horse heavy vehicle....	1	3	.....	6	14	5	13	42	6.0
Two horse light vehicle.....	3	2	2	9	4	6	6	32	4.8
Two horse heavy vehicle....	12	10	.....	10	14	14	12	72	10.2
Runabout	9	6	6	2	4	4	3	34	4.8
Touring Car	43	32	52	47	38	53	32	297	42.4
Motor Truck	1	5	.....	2	3	4	5	20	2.8
Total	95	102	94	119	121	131	109	771	110.1

Condition of Road:—Gravel road, in good condition.

PROOF LINE ROAD—Station No. 17—Lot 16, Concesssion X, London Township.

Friday, August 7, to Thursday, August 13, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Cloudy	Sat. Fair	Sun. Cloudy	Mon. Rain	Tues. Cloudy	Wed. Fair	Thur. Cloudy	Total	Daily Average
One horse light vehicle.....	15	30	35	32	29	18	18	177	25.3
One horse heavy vehicle....	4	9	.....	10	12	7	11	53	7.6
Two horse light vehicle.....	.....	1	.....	1	.....	.....	.....	2	0.3
Two horse heavy vehicle ...	2	7	.....	9	15	11	9	53	7.6
Runabout	9	4	15	2	2	3	5	40	5.7
Touring Car	34	28	46	21	23	34	20	206	29.4
Motor Truck	4	7	1	4	5	6	5	32	4.5
Total	68	86	97	79	86	79	68	563	80.4

Condition of Road:—Gravel road, in good condition.

ADELAIDE STREET—Station No. 18—Fanshawe.

Sunday, August 9, to Saturday, August 15, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sun. Cloudy	Mon. Rain	Tues. Cloudy	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Total	Daily Average
One horse light vehicle.....	23	22	10	7	9	14	21	106	15.1
One horse heavy vehicle....	3	7	8	5	5	3	11	42	6.0
Two horse light vehicle.....	.....	3	1	4	2	2	.....	12	1.7
Two horse heavy vehicle ..	.....	4	9	4	4	5	2	28	4.0
Runabout	3	.....	.....	.....	.....	.....	.....	3	0.4
Touring Car	16	5	5	3	2	5	3	39	5.6
Motor Truck	.....	1	.....	.....	.....	.....	.....	1	0.2
Total	45	42	33	23	22	29	37	231	33.0

Condition of Road:—Gravel road, in good condition.

ADELAIDE STREET—Station No. 19—Ballymote.

Monday, August 10, to Sunday, August 16, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Rain	Tues. Rain	Wed. Rain	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Rain	Total	Daily Average
One horse light vehicle.....	31	14	79	13	25	42	47	251	35.8
One horse heavy vehicle....	29	19	23	17	27	34	1	150	21.4
Two horse light vehicle.....	1	4	10	9	2	3	.....	29	4.3
Two horse heavy vehicle ...	18	26	23	20	24	18	.....	129	18.4
Runabout	.....	.....	2	.....	.....	4	3	9	1.2
Touring Car	4	7	32	1	5	2	10	61	8.7
Motor Truck	1	1	.....	3	.....	2	.....	7	1.0
Total	84	71	169	63	83	105	61	636	90.8

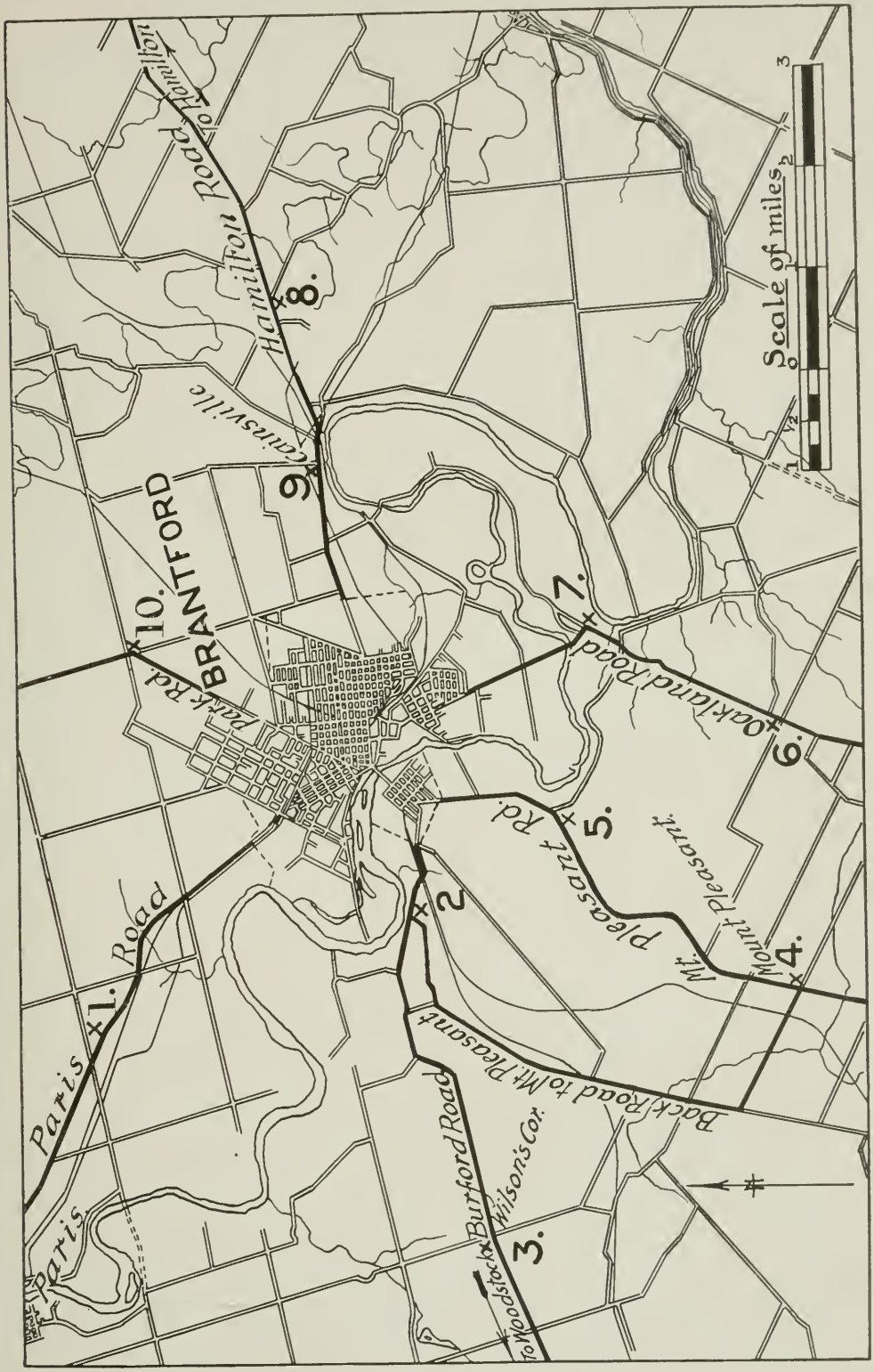
Condition of Road:—Gravel road, in good condition.

Brantford.

Census was taken from Wednesday, August 12, to Tuesday, August 18, inclusive.

The following roads were taken into consideration:—

Name of Road.	Number of Stations.	Distance from City Limits.
1 Paris Road	1	3 miles.
2 Burford Road	2	1½ and 4½ miles.
3 Back Road to Mount Pleasant	1	1½ miles.
4 Mount Pleasant Road	2	1½ and 4½ miles.
5 Oakland Road	2	1½ and 4 miles.
6 Hamilton Road	2	1½ and 3½ miles.
7 Park Road	1	1 mile.
	11 (represented by 10 stations on map).	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1
2
3
Hamilton Road to Hamilton
Canfield
Canfield
Canfield

There are several shipping and market centres in the traffic area, viz.:— Cainsville, Mount Pleasant, Burford and Paris. These cause a certain amount of local traffic on roads.

The latter part of "Old Boys'" week was being celebrated in the city while the census was taken; this might account for a little heavy traffic from the surrounding district but would diminish outbound traffic originating in the city itself.

Paris and Oakland Roads are toll roads, built of stone and in parts very poor.

The remaining roads are all in poor condition: the old method of trimming shoulders and dumping earth on top of stone in the centre of the road has been the common practice.

With a good stone surface on Hamilton Road, the motor traffic would be very heavy between Brantford and Hamilton.

During the census a bridge was down on Hamilton Road and traffic was diverted north and south; in order to take count of this diverted traffic, the census officer was stationed at junction of Onondaga Road, as shown in schedule under Station 8.

PARIS ROAD—Station No. 1—Lot 22, Concession II, Dumfries S. Township.

Wednesday, August 12, to Tuesday, August 18, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Rain	Fri. Fair	Sat. Fine	Sun. Cloudy	Mon. Fine	Tues. Rain	Total	Daily Average
One horse light vehicle.....	34	22	26	35	30	15	12	174	24.9
One horse heavy vehicle....	5	1	3	3	.....	5	3	20	2.9
Two horse light vehicle.....	1	1	3	1	3	.....	3	12	1.7
Two horse heavy vehicle....	.....	9	18	10	.....	14	14	65	9.3
Runabout	18	3	22	21	15	11	7	97	13.8
Touring Car	65	41	37	35	39	39	19	275	39.3
Motor Truck	1	2	2	1	3	5	2	16	2.3
Total	124	79	111	106	90	89	60	659	94.2

Condition of Road:—(Toll Road). Stone road, in good condition.

BURFORD ROAD—Station No. 2—Junction of Back Road to Mount Pleasant.

Including traffic from Back Road.

Wednesday, August 12, to Tuesday, August 18, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Fine	Sun. Fair	Mon. Fine	Tues. Cloudy	Total	Daily Average
One horse light vehicle.....	202	122	171	203	81	104	83	966	138.0
One horse heavy vehicle....	3	2	9	4	.....	4	5	27	3.9
Two horse light vehicle.....	39	20	27	29	9	16	7	147	21.0
Two horse heavy vehicle ...	7	20	17	17	1	33	13	108	15.4
Runabout	6	2	3	4	3	9	3	30	4.2
Touring Car	162	114	97	68	109	66	70	686	98.0
Motor Truck	6	7	6	2	.....	2	3	26	3.7
Total	425	287	330	327	203	234	184	1,990	284.2

Condition of Road:—Stone road, in poor condition.

BURFORD ROAD—STATION No. 2—Junction of Back Road to Mount Pleasant.

Excluding traffic from Back Road.

Wednesday, August 12, to Tuesday, August 18, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Fine	Sun. Fair	Mon. Fine	Tues. Cloudy	Total	Daily Average
One horse light vehicle.....	162	27	34	150	62	90	17	542	77.4
One horse heavy vehicle....	3	.....	4	4	.....	4	1	16	2.3
Two horse light vehicle.....	23	10	14	13	5	13	4	82	11.7
Two horse heavy vehicle....	6	2	6	15	1	27	4	61	8.7
Runabout	6	2	2	3	3	6	3	25	3.5
Touring Car	116	37	28	47	79	46	22	375	53.7
Motor Truck	3	2	2	1	.....	2	.....	10	1.4
Total	319	80	90	233	150	188	51	1,111	158.7

Condition of Road:—Stone road, in poor condition.

BURFORD ROAD—Station No. 3—Wilson's Corners.

Wednesday, August 12, to Tuesday, August 18, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Fine	Sun. Fair	Mon. Fine	Tues. Cloudy	Total	Daily Average
One horse light vehicle.....	76	41	66	56	45	30	27	341	48.7
One horse heavy vehicle....	6	15	8	19	3	8	5	64	9.1
Two horse light vehicle.....	4	2	5	6	6	14	4	41	5.9
Two horse heavy vehicle....	3	11	11	5	.....	9	6	45	6.4
Runabout	2	4	.....	4	4	5	.....	19	2.7
Touring Car	65	67	55	39	56	33	28	343	49.0
Motor Truck	.....	5	.....	.....	.....	.....	1	6	0.9
Total	156	145	145	129	114	99	71	859	122.7

Condition of Road:—Stone road, in very poor condition.

BACK ROAD TO MOUNT PLEASANT—Station No. 2—Junction of Burford Road.

Wednesday, August 12, to Tuesday, August 18, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Fine	Sun. Fair	Mon. Fine	Tues. Cloudy	Total	Daily Average
One horse light vehicle.....	40	95	137	53	19	14	66	424	60.6
One horse heavy vehicle.....	.....	2	5	.....	.....	.....	4	11	1.6
Two horse light vehicle.....	16	10	13	16	4	3	3	65	9.3
Two horse heavy vehicle....	1	18	11	2	.....	6	9	47	6.7
Runabout	.....	.....	1	1	.....	3	.....	5	0.7
Touring Car	46	77	69	21	30	20	48	311	44.4
Motor Truck	3	5	4	1	.....	.....	3	16	2.3
Total	106	207	240	94	53	46	133	879	125.6

Condition of Road:—Stone road in parts, very rough.

MOUNT PLEASANT ROAD—Station No. 5—Junction of Back Road to Newport.

Wednesday, August 12, to Tuesday, August 18, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Rain	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle.....	98	93	117	144	81	50	86	669	95.6
One horse heavy vehicle....	28	37	23	44	3	18	31	184	26.3
Two horse light vehicle.....	7	5	14	21	10	6	4	67	9.6
Two horse heavy vehicle....	39	21	25	46	.....	34	28	193	27.6
Runabout	2	4	4	3	3	3	4	23	3.3
Touring Car	51	50	38	53	57	31	36	316	45.1
Motor Truck	1	4	9	4	.....	.....	1	19	2.7
Total	226	214	230	315	154	142	190	1,471	210.2

Condition of Road:—Stone road, very rough.

MOUNT PLEASANT ROAD—Station No. 4—Mount Pleasant (Mohawk P.O.)

Wednesday, August 12, to Tuesday, August 18, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fine	Mon. Fine	Tues. Fine	Total	Daily Average
One horse light vehicle.....	84	88	104	82	117	84	76	635	90.7
One horse heavy vehicle....	15	33	37	52	5	36	34	212	30.3
Two horse light vehicle.....	12	6	16	23	13	6	7	83	11.9
Two horse heavy vehicle....	38	18	35	15	.....	29	22	157	22.4
Runabout	3	3	4	2	4	5	.....	21	3.0
Touring Car	17	21	19	22	26	10	13	128	18.3
Motor Truck	1	3	10	4	.....	1	11	30	4.3
Total	170	172	225	200	165	171	163	1.266	180.9

Condition of Road:—Stone road, very rough.

OAKLAND ROAD—Station No. 7—First Toll Gate.

Wednesday, August 12, to Tuesday, August 18, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Shwry	Fri. Fine	Sat. Fine	Sun. Fine	Mon. Fine	Tues. Cloudy	Total	Daily Average
One horse light vehicle.....	242	156	158	271	81	86	62	1,056	150.9
One horse heavy vehicle....	4	19	16	24	6	21	20	110	15.7
Two horse light vehicle.....	20	20	16	22	7	2	4	91	13.0
Two horse heavy vehicle....	20	23	26	51	.....	72	58	250	35.7
Runabout	2	3	4	.....	7	.....	4	20	2.8
Touring Car	33	51	30	31	56	29	12	242	34.6
Motor Truck	.....	.....	.....	.....	2	1	2	5	0.7
Total	321	272	250	399	159	211	162	1,774	253.4

Condition of Road:—(Toll Road). Stone road, in good condition.

OAKLAND ROAD—Station No. 6—Second Toll Gate.

Wednesday, August 12, to Tuesday, August 18, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Fine	Sat. Rain	Mon. Cloudy	Tues. Fair	Total	Daily Average
One horse light vehicle.....	93	63	62	79	34	12	20	363	51.9
One horse heavy vehicle....	9	24	18	45	4	11	15	126	18.0
Two horse light vehicle.....	10	13	13	25	.....	1	6	68	9.7
Two horse heavy vehicle....	10	22	18	36	.....	35	12	133	19.0
Runabout	1	3	2	4	4	.....	1	15	2.1
Touring Car	22	39	16	22	38	19	2	158	22.6
Motor Truck	.....	.....	.....	.....	2	.....	2	4	0.6
Total	145	164	129	211	82	78	58	867	123.9

Condition of Road:—(Toll Road). Stone road, in good condition.

HAMILTON ROAD—Station 9—Cainsville.

Wednesday, August 12, to Tuesday, August 18, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Shwry	Fri. Fair	Sat. Fine	Sun. Shwry	Mon. Fair	Tues. Shwry	Total	Daily Average
One horse light vehicle.....	142	96	101	221	134	101	70	865	123.6
One horse heavy vehicle....	38	55	76	123	5	86	92	475	67.9
Two horse light vehicle.....	8	.....	2	1	.....	4	6	21	3.0
Two horse heavy vehicle....	76	56	64	95	1	76	69	437	62.4
Runabout	20	13	6	13	24	14	7	97	13.9
Touring Car	149	109	113	121	142	112	76	822	117.4
Motor Truck	.....	.....	.....	4	.....	.....	.....	4	0.6
Total	433	329	362	578	306	393	320	2,721	388.8

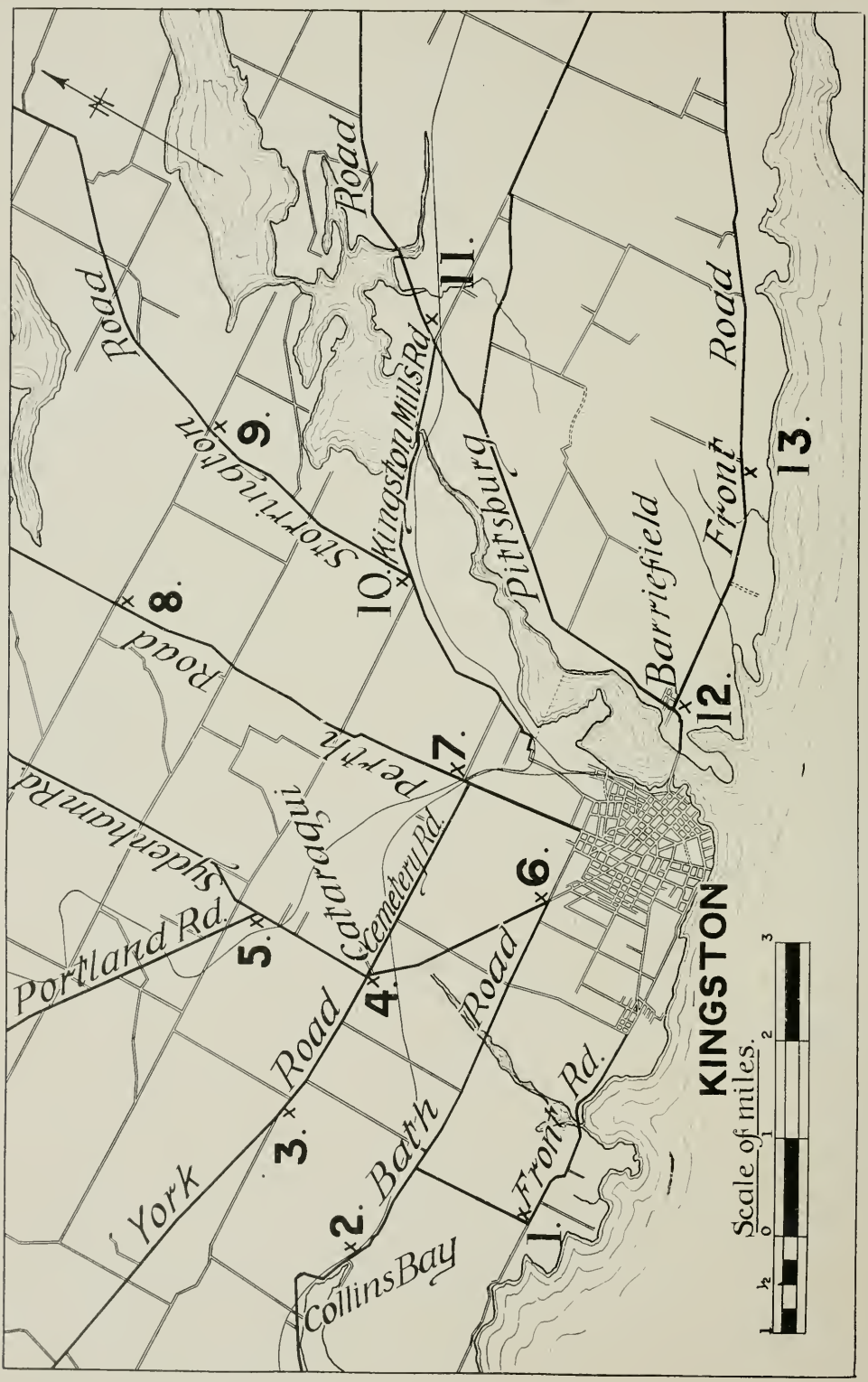
Condition of Road:—Stone road, in very poor condition.

HAMILTON ROAD—Station No. 8—Junction of Onondaga Road.

Wednesday, August 12, to Tuesday, August 18, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Rain	Mon. Fair	Tues. Cloudy	Total	Daily Average
One horse light vehicle.....	99	29	38	50	35	31	33	315	45.0
One horse heavy vehicle....	4	8	9	6	.....	3	11	41	5.9
Two horse light vehicle.....	12	6	13	12	2	2	5	52	7.4
Two horse heavy vehicle....	7	27	6	20	.....	30	18	108	15.4
Runabout	8	6	4	3	7	11	4	43	6.2
Touring Car	85	68	64	69	69	58	33	446	63.7
Motor Truck	.....	.....	.....	.....	.....	2	.....	2	0.3
Total	215	144	134	160	113	137	104	1,007	143.9

Condition of Road:—Stone road, in very poor condition.


Collins Bay
York
Road
Portland Rd.
Sydenham Rd.
Road
Cataraqui
Cemetery Rd.
Perth
Road
Stoprriqaton
Road
Kingston Mills Rd.
Road
Pittsburg
Barriefield
Front
Road
Front Rd.
Road
Bath
1.
2.
3.
4.
5.
6.
7.
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9.
10.
11.
12.
13.
KINGSTON
Scale of miles.
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PARK ROAD—Station No. 10—Junction of II Concession Road, Brantford Township.

Wednesday, August 12, to Tuesday, August 18, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Shwry	Mon. Fair	Tues. Cloudy	Total	Daily Average
One horse light vehicle.....	61	68	68	60	57	35	26	375	53.6
One horse heavy vehicle....	30	30	28	44	12	21	23	188	26.8
Two horse light vehicle.....	17	6	14	27	2	9	11	86	12.3
Two horse heavy vehicle....	2	12	12	7	.....	11	19	63	9.0
Runabout	3	5	16	20	14	6	8	72	10.3
Touring Car	21	14	20	9	16	9	9	98	14.0
Motor Truck	.....	1	.....	.....	.....	.....	1	2	0.3
Total	134	136	158	167	101	91	97	884	126.3

Condition of Road:—Clay road, in poor condition.

Kingston.

Census was taken from Wednesday, July 29, to Tuesday, August 4, inclusive. The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Front Road (*Kingston Township*)	1	2 miles.
2	Bath Road	2	¼ and 5 miles.
3	York Road	3	¼, 2½ and 5 miles.
4	Cemetery Road	1	2½ miles.
5	Sydenham Road	2	2½ and 4½ miles.
6	Portland Road	1	4½ miles.
7	Perth Road	2	2 and 6 miles.
8	Storrington Road	2	3½ and 6 ½ miles.
9	Kingston Mills Road	2	3½ and 5 miles.
10	Pittsburg Road	2	½ and 5 miles.
11	Front Road (*Pittsburg Township*)	2	½ and 3½ miles.
		20 (represented by 13 stations on map).	

Within the traffic area are several shipping and market centres, viz.:—Cataraqui, Collins Bay and Glenvale. These cause a certain amount of local traffic, but not to any great extent, as Kingston is the principal market.

There are sand pits located on Lot 3, Concession V, Kingston Township, about 5½ miles from the city limits, on Storrington Road. The traffic from these pits is shown in the schedule under Station 10, (Class — Motor Truck). The vehicle used is a steam truck hauling a wagon, and the load carried is nine tons. This traffic has cut up the said road very badly, there being four deep ruts.

There is a heavy two-horse vehicular traffic on the York Road, for about two miles from the city limits, to and from sand pits near Cataraqui. Heavy farm traffic also uses this road.

After 7 p.m. there is a very heavy motor pleasure traffic on Kingston Mills and Pittsburg Roads, this being a circular and very picturesque route.

The roads adjacent to the city are built of stone and, with the exception of part of Storrington Road, are all in good condition.

FRONT ROAD (KINGSTON TOWNSHIP)—Station No. 1.—Lot 9, Concession I, Kingston Township

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Shwry	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	25	27	20	14	44	17	18	165	23.5
One horse heavy vehicle	10	15	18	14	5	9	21	92	13.4
Two horse light vehicle	.....	.....	2	2	5	2	2	13	1.8
Two horse heavy vehicle	5	13	8	10	4	13	8	61	8.7
Runabout	3	3	2	6	.....	2	2	18	2.5
Touring Car	19	27	19	20	53	22	25	185	26.4
Motor Truck	.....	.....	.....	.....	1	.....	.....	1	0.1
Total	62	85	69	66	112	65	76	535	76.4

Condition of Road:—Stone road, solid but rough.

BATH ROAD—Station No. 6—Junction of York Road.

Excluding traffic from York Road.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fine	Fri. Fair	Sat. Cloudy	Sun. Fine	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	62	70	57	81	107	60	71	508	72.6
One horse heavy vehicle	54	33	48	82	17	60	75	369	52.7
Two horse light vehicle	2	.....	.....	5	.....	.....	.....	7	1.0
Two horse heavy vehicle	19	31	15	30	2	22	36	155	22.1
Runabout	12	18	15	24	24	28	24	145	20.7
Touring Car	26	22	18	28	20	16	26	156	22.3
Motor Truck	.....	.....	.....	2	.....	1	.....	3	0.4
Total	175	174	153	252	170	187	232	1,343	191.8

Condition of Road:—Stone road, in good condition.

BATH ROAD—Station No. 2—East of Collin's Bay.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fine	Sun. Cloudy	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	35	36	34	47	69	38	37	296	42.2
One horse heavy vehicle	14	19	20	32	10	21	20	136	19.4
Two horse light vehicle	3	.....	3	2	13	3	.....	24	3.4
Two horse heavy vehicle	7	22	15	18	4	20	19	105	15.0
Runabout	4	4	.....	8	14	.....	1	31	4.6
Touring Car	17	29	12	31	52	15	29	185	26.4
Motor Truck	.....	.....	.....	.....	1	.....	.....	1	0.1
Total	80	110	84	138	163	97	106	778	111.1

Condition of Road:—Stone road, rough in parts.

YORK ROAD—Station No. 6—Junction of Bath Road,

Including traffic from Bath Road.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fine	Fri. Fair	Sat. Cloudy	Sun. Fine	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle.....	179	215	178	335	281	188	195	1,571	224.4
One horse heavy vehicle....	124	115	119	238	25	132	146	899	128.4
Two horse light vehicle.....	9	2	2	11	2	.....	7	33	4.7
Two horse heavy vehicle....	86	181	70	234	19	93	104	787	112.4
Runabout	26	38	42	52	62	81	47	348	49.7
Touring Car	66	53	39	56	44	48	48	354	50.6
Motor Truck	2	4	2	4	.....	3	2	17	2.4
Total	492	608	452	930	433	545	549	4,009	572,6

Condition of Road:—Stone road, in good condition.

YORK ROAD—Station No. 6—Junction of Bath Road.

Excluding traffic from Bath Road.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fine	Fri. Fair	Sat. Cloudy	Sun. Fine	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle.....	117	145	121	254	174	128	124	1,063	151.8
One horse heavy vehicle.....	70	82	71	156	8	72	71	530	75.7
Two horse light vehicle.....	7	2	2	6	2	.....	7	26	3.7
Two horse heavy vehicle.....	67	150	55	204	17	71	68	632	90.3
Runabout	14	20	27	28	38	53	23	203	29.0
Touring Car.....	40	31	21	28	24	32	22	198	28.3
Motor Truck.....	2	4	2	2	.....	2	2	14	2.0
Total	317	434	299	678	263	358	317	2,666	380.8

Condition of Road:—Stone road, in good condition.
Remarks:—The extra heavy two-horse vehicle traffic is to and from sand pits near Cataraqui. There is also a large farm traffic on this section of road.

YORK ROAD—Station No. 4—Cataraqui (Junction of Sydenham and Cemetery Roads)

Including traffic from Sydenham and Cemetery Roads.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle.....	148	134	142	252	230	156	145	1,207	172.4
One horse heavy vehicle.....	132	116	123	157	9	109	105	751	107.3
Two horse light vehicle.....	27	42	26	42	16	21	16	190	27.2
Two horse heavy vehicle.....	85	133	66	198	19	103	121	725	103.5
Runabout	16	18	12	10	45	14	5	120	17.2
Touring Car.....	46	47	40	34	50	47	55	319	45.6
Motor Truck.....	2	2	2	2	.....	6	2	16	2.3
Total	456	492	411	695	369	456	449	3,328	475.5

Condition of Road:—Stone road, in good condition.

YORK ROAD—Station No. 4—Cataraqui (Junction of Sydenham and Cemetery Roads).

Excluding traffic from Sydenham and Cemetery Roads.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	74	61	46	107	96	54	54	492	70.3
One horse heavy vehicle	72	42	46	54	4	31	33	282	40.3
Two horse light vehicle	12	14	3	17	4	.....	1	51	7.3
Two horse heavy vehicle	40	50	28	93	4	27	39	281	40.1
Runabout	8	8	5	6	9	6	4	46	6.6
Touring Car	28	15	15	8	11	11	15	103	14.7
Motor Truck	.....	2	2	2	.....	2	2	10	1.4
Total	234	192	145	287	128	131	148	1,265	180.7

Condition of Road:—Stone road, in good condition.

YORK ROAD—Station No. 3—Junction of III. Concession Road.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Shwry	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	23	26	27	71	35	43	23	248	35.4
One horse heavy vehicle	10	33	20	40	2	14	19	138	19.7
Two horse light vehicle	8	41	3	79	7	8	11	157	22.4
Two horse heavy vehicle	9	14	8	10	.....	19	6	66	9.4
Runabout	4	5	1	3	11	1	1	26	3.7
Touring Car	24	26	24	21	42	24	30	191	27.4
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	78	145	83	224	97	109	90	826	118.0

Condition of Road:—Stone road, in good condition.

CEMETERY ROAD—Station No. 4– Cataraqui (Junction of York and Sydenham Roads).

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	24	9	30	31	41	28	20	183	26.1
One horse heavy vehicle	19	7	13	15	.....	28	18	100	14.3
Two horse light vehicle	7	12	12	4	8	19	5	67	9.6
Two horse heavy vehicle	19	15	10	13	8	23	27	115	16.4
Runabout	.....	1	.....	.....	8	.....	.....	9	1.3
Touring Car	.....	4	.....	2	10	13	3	32	4.6
Motor Truck	.....	.....	.....	.....	.....	2	.....	2	0.3
Total	69	48	65	65	75	113	73	508	72.6

Condition of Road.—Stone road, very rough.

SYDENHAM ROAD—Station No. 4—Cataraqui (Junction of York and Cemetery Roads).

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	50	64	66	114	93	74	71	532	76.0
One horse heavy vehicle	41	67	64	88	5	50	54	369	52.7
Two horse light vehicle	8	16	11	21	4	2	10	72	10.3
Two horse heavy vehicle	26	68	28	92	7	53	55	329	47.0
Runabout	8	9	7	4	28	8	1	65	9.3
Touring Car	18	28	25	24	29	23	37	184	26.3
Motor Truck	2	.....	.....	.....	.....	2	.....	4	0.6
Total	153	252	201	343	166	212	228	1,555	222.2

Condition of Road:—Stone road, in good condition.

SYDENHAM ROAD—Station No. 5—Junction of Portland Road.

Including traffic from Portland Road.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Total	Daily Average
Two horse light vehicle	46	38	49	40	105	73	47	398	56.9
One horse heavy vehicle	17	18	18	20	44	3	16	136	19.3
Two horse light vehicle	16	16	34	10	83	5	13	177	25.3
Two horse heavy vehicle	20	10	8	11	22	.....	11	82	11.7
Runabout	.....	.....	4	2	3	2	2	13	1.9
Touring Car	11	15	14	16	12	15	14	97	13.9
Motor Truck	2	2	2	2	2	.....	2	12	1.7
Total	112	99	129	101	271	98	105	915	130.7

Condition of Road:—Stone road, in good condition.

SYDENHAM ROAD—Station No. 5—Junction of Portland Road.

Excluding traffic from Portland Road.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fair	Thur. Mon	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Total	Daily Average
One horse light vehicle	21	30	24	25	52	44	30	226	32.3
One horse heavy vehicle	14	10	9	13	23	.....	9	78	11.1
Two horse light vehicle	6	6	18	5	34	3	8	80	11.4
Two horse heavy vehicle	11	6	4	5	9	.....	7	42	6.0
Runabout	.....	.....	1	.....	1	2	.....	4	0.6
Touring Car	7	10	7	10	6	9	11	60	8.6
Motor Truck	2	2	2	2	2	.....	2	12	1.7
Total	61	64	65	60	127	58	67	502	71.7

Condition of Road:—Stone road, in good condition.

PORTLAND ROAD—Station No. 5—Junction of Sydenham Road.

Tuesday, July 28, to Monday, August 3, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Total	Daily Average
One horse light vehicle	25	8	25	15	53	29	17	172	24.6
Two horse heavy vehicle	3	8	9	7	21	3	7	58	8.2
Two horse light vehicle	10	10	16	5	49	2	5	97	13.9
Two horse heavy vehicle	9	4	4	6	13	.....	4	40	5.7
Runabout	.....	.....	3	2	2	.....	2	9	1.3
Touring Car	4	5	7	6	6	6	3	37	5.3
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	51	35	64	41	144	40	38	413	59.0

Condition of Road:—Stone road, in good condition.

PERTH ROAD—Station No. 7—North of Cemetery Road.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Cloudy	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	48	54	27	80	56	54	48	367	52.4
One horse heavy vehicle	35	31	29	42	22	25	21	205	29.3
Two horse light vehicle	9	19	7	42	7	12	13	109	15.5
Two horse heavy vehicle	11	13	8	30	.....	16	11	89	12.7
Runabout	.....	1	1	1	2	2	1	8	1.2
Touring Car	12	22	12	23	41	24	22	156	22.3
Motor Truck	6	4	5	.....	1	3	4	23	3.3
Total	121	144	89	218	129	136	120	957	136.7

Condition of Road:—Stone road, in good condition.

PERTH ROAD—Station No. 8—South of V Concession Road.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	16	27	16	40	37	12	20	168	24.0
One horse heavy vehicle	7	11	5	12	3	1	4	43	6.3
Two horse light vehicle	7	14	11	56	2	11	17	118	16.8
Two horse heavy vehicle	4	5	4	14	.....	8	5	40	5.7
Runabout	2	1	1	2	5	4	.....	15	2.1
Touring Car	10	19	10	23	29	21	24	136	19.4
Motor Truck	6	3	6	.....	2	3	3	23	3.2
Total	52	80	53	147	78	60	73	543	77.5

Condition of Road:—Stone road, in good condition.

STORRINGTON ROAD—Station No. 10—Tuttleshill (Junction of Kingston Mills Road).

Including traffic from Kingston Mills Road.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Fine	Fri. Cloudy	Sat. Cloudy	Sun. Cloudy	Mon. Fine	Tues. Fine	Total	Daily Average
One horse light vehicle	40	35	35	62	74	50	55	351	50.2
One horse heavy vehicle	17	13	12	17	10	11	8	88	12.6
Two horse light vehicle	8	4	4	10	2	2	5	35	5.0
Two horse heavy vehicle	46	29	41	70	5	30	34	255	36.4
Runabout	5	2	.....	2	1	.....	.....	10	1.4
Touring Car	12	7	6	10	24	6	6	71	10.1
Motor Truck	33	6	36	21	.....	31	18	145	20.7
Total	161	96	134	192	116	130	126	955	136.4

Condition of Road:—Stone road, badly rutted.

STORRINGTON ROAD—Station No. 10—Tuttleshill (Junction of Kingston Mills Road).

Excluding traffic from Kingston Mills Road.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Fine	Fri. Cloudy	Sat. Cloudy	Sun. Cloudy	Mon. Fine	Tues. Fine	Total	Daily Average
One horse light vehicle	25	13	21	22	27	19	29	156	22.3
One horse heavy vehicle	8	6	10	5	3	3	5	40	5.7
Two horse light vehicle	3	2	2	1	.....	2	1	11	1.6
Two horse heavy vehicle	36	22	35	9	1	6	27	136	19.4
Runabout	2	2	.....	2	.....	.....	....	6	0.8
Touring Car	11	6	5	2	11	4	1	40	5.7
Motor Truck	33	6	36	.....	.....	.....	18	93	13.3
Total	118	57	109	41	42	34	81	482	68.8

Remarks:—This stone road is badly cut up and rutted, caused by excessive steam truck traffic to and from sand pits located about 1 mile north of station.

STORRINGTON ROAD—Station No. 9—South of V. Concession Road.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fine	Mon. Fine	Tues. Fine	Total	Daily Average
One horse light vehicle	10	29	12	33	57	14	19	174	24.8
One horse heavy vehicle	5	4	5	11	10	4	2	41	5.8
Two horse light vehicle	14	17	17	27	8	8	9	100	14.2
Two horse heavy vehicle	4	7	7	19	9	8	11	65	9.2
Runabout	4	5	4	9	5	4	5	36	5.1
Touring Car	6	6	5	3	16	.....	1	37	5.6
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	43	68	50	102	105	38	47	453	64.7

Condition of Road:—Stone road, in good condition.

KINGSTON MILLS ROAD—Station No. 10—Tuttleshill (Junction of Storrington Road).

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Fine	Fri. Cloudy	Sat. Cloudy	Sun. Cloudy	Mon. Fine	Tues. Fine	Total	Daily Average
One horse light vehicle	15	22	14	40	47	31	26	195	27.9
One horse heavy vehicle	9	7	2	12	7	8	3	48	6.9
Two horse light vehicle	5	2	2	9	2	.....	4	24	3.4
Two horse heavy vehicle	10	7	6	61	4	24	7	119	17.0
Runabout	3	.....	.....	.....	1	.....	.....	4	0.6
Touring Car	1	1	1	8	13	2	5	31	4.4
Motor Truck	.....	.....	.....	21	.....	31	.....	52	7.4
Total	43	39	25	151	74	96	45	473	67.6

Condition of Road:—Stone road, with loose stones on surface and rough in parts.
Remarks:—The motor-truck traffic is from sand pits located about 1 mile north of station, on Storrington Road. The vehicle used is steam truck, hauling a wagon with an average load of 9 tons.

KINGSTON MILLS ROAD—Station No. 11—Cunningham Corners (Junction of Pittsburg Road).

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Cloudy	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	15	11	9	17	74	18	21	165	23.6
One horse heavy vehicle	12	5	4	5	6	2	6	40	5.7
Two horse light vehicle	5	11	5	7	7	5	9	49	7.0
Two horse heavy vehicle	8	2	7	5	1	6	3	32	4.6
Runabout	.....	1	.....	.....	1	.....	.....	2	0.3
Touring Car	6	7	5	.....	15	7	3	43	6.1
Motor Truck	.....	2	.....	.....	.....	.....	.....	2	0.3
Total	46	39	30	34	104	38	42	333	47.6

Condition of Road:—Stone road, rough in parts.

PITTSBURG ROAD—Station No. 12—Barriefield (Junction of Front Road).

Including traffic from Front Road.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	72	53	78	138	143	113	133	730	104.2
One horse heavy vehicle	56	88	91	111	18	122	117	603	86.1
Two horse light vehicle	18	33	20	66	5	22	19	183	26.2
Two horse heavy vehicle	43	41	43	70	.....	62	53	312	44.6
Runabout	15	11	6	9	4	2	.....	47	6.7
Touring Car	70	67	69	63	71	82	72	494	70.6
Motor Truck	.....	2	.....	.....	.....	3	2	7	1.0
Total	274	295	307	457	241	406	396	2,376	339.4

Condition of Road:—Stone road, solid but rough.

PITTSBURG ROAD—Station No. 12—Barriefield (Junction of Front Road)

Excluding traffic from Front Road.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	39	28	46	53	56	65	45	332	47.4
One horse heavy vehicle	29	33	35	47	2	69	62	277	39.6
Two horse light vehicle	8	4	14	21	.....	10	12	69	9.9
Two horse heavy vehicle	11	28	22	47	.....	19	11	138	19.7
Runabout	11	3	4	1	1	2	.....	22	3.1
Touring Car	28	35	32	40	43	33	27	238	34.0
Motor Truck	.....	.....	.....	.....	.....	2	1	3	0.4
Total	126	131	153	209	102	200	158	1,079	154.1

Condition of Road:—Stone road, in good condition.

PITTSBURG ROAD—Station No. 11—Cunningham Corners (Junction of Kingston Mills Road)

Including traffic from Kingston Mills Road.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Cloudy	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	28	17	23	42	125	41	25	301	43.0
One horse heavy vehicle	16	10	6	6	11	3	10	62	8.8
Two horse light vehicle	13	28	13	35	9	11	16	125	17.9
Two horse heavy vehicle	14	5	14	14	1	9	8	65	9.3
Runabout	.....	2	2	1	2	2	.....	9	1.3
Touring Car	21	23	21	7	26	21	19	138	19.7
Motor Truck	.....	4	.....	.....	.....	.....	.....	4	0.6
Total	92	89	79	105	174	87	78	704	100.6

Condition of Road:—Stone road, in good condition.

PITTSBURG ROAD—Station No. 11—Cunningham Corners (Junction of Kingston Mills Road)

Excluding traffic from Kingston Mills Road.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Cloudy	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	13	6	14	25	51	23	4	136	19.4
One horse heavy vehicle	4	5	2	1	5	1	4	22	3.1
Two horse light vehicle	8	17	8	28	2	6	7	76	10.9
Two horse heavy vehicle	6	3	7	9	.....	3	5	33	4.7
Runabout	.....	1	2	1	1	2	.....	7	1.0
Touring Car	15	16	16	7	11	14	16	95	13.6
Motor Truck	.....	2	.....	.....	.....	.....	.....	2	0.3
Total	46	50	49	71	70	49	36	371	53.0

Condition of Road:—Stone road, in good condition.

FRONT ROAD (Pittsburg Township)—Station No. 12—Barriefield (Junction of Pittsburg Road).

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	33	25	32	85	87	48	88	398	56.8
One horse heavy vehicle	27	55	56	64	16	53	55	326	46.5
Two horse light vehicle	10	29	6	45	5	12	7	114	16.3
Two horse heavy vehicle	32	13	21	23	.....	43	42	174	24.9
Runabout	4	8	2	8	3	.....	.....	25	3.6
Touring Car	42	32	37	23	28	49	45	256	36.6
Motor Truck	.....	2	.....	.....	.....	1	1	4	0.6
Total	148	164	154	248	139	206	238	1,297	185.3

Condition of Road:—Stone road, solid but rough.

FRONT ROAD (Pittsburg Township)—Station 13—Lot 1, Concession I, Pittsburg Township.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Cloudy	Thur. Fine	Fri. Fine	Sat. Fair	Sun. Fine	Mon. Fine	Tues. Fine	Total	Daily Average
One horse light vehicle	10	11	10	29	23	19	23	125	17.8
One horse heavy vehicle	6	.....	2	2	.....	17	4	31	4.4
Two horse light vehicle	2	1	6	2	.....	.....	6	17	2.4
Two horse heavy vehicle	7	5	5	13	.....	5	3	38	5.6
Runabout	1	.....	.....	.....	1	.....	.....	2	0.2
Touring Car	16	20	18	9	24	10	22	119	17.0
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	42	37	41	55	48	51	58	332	47.4

Condition of Road:—Stone road, solid but rough.

Peterborough.

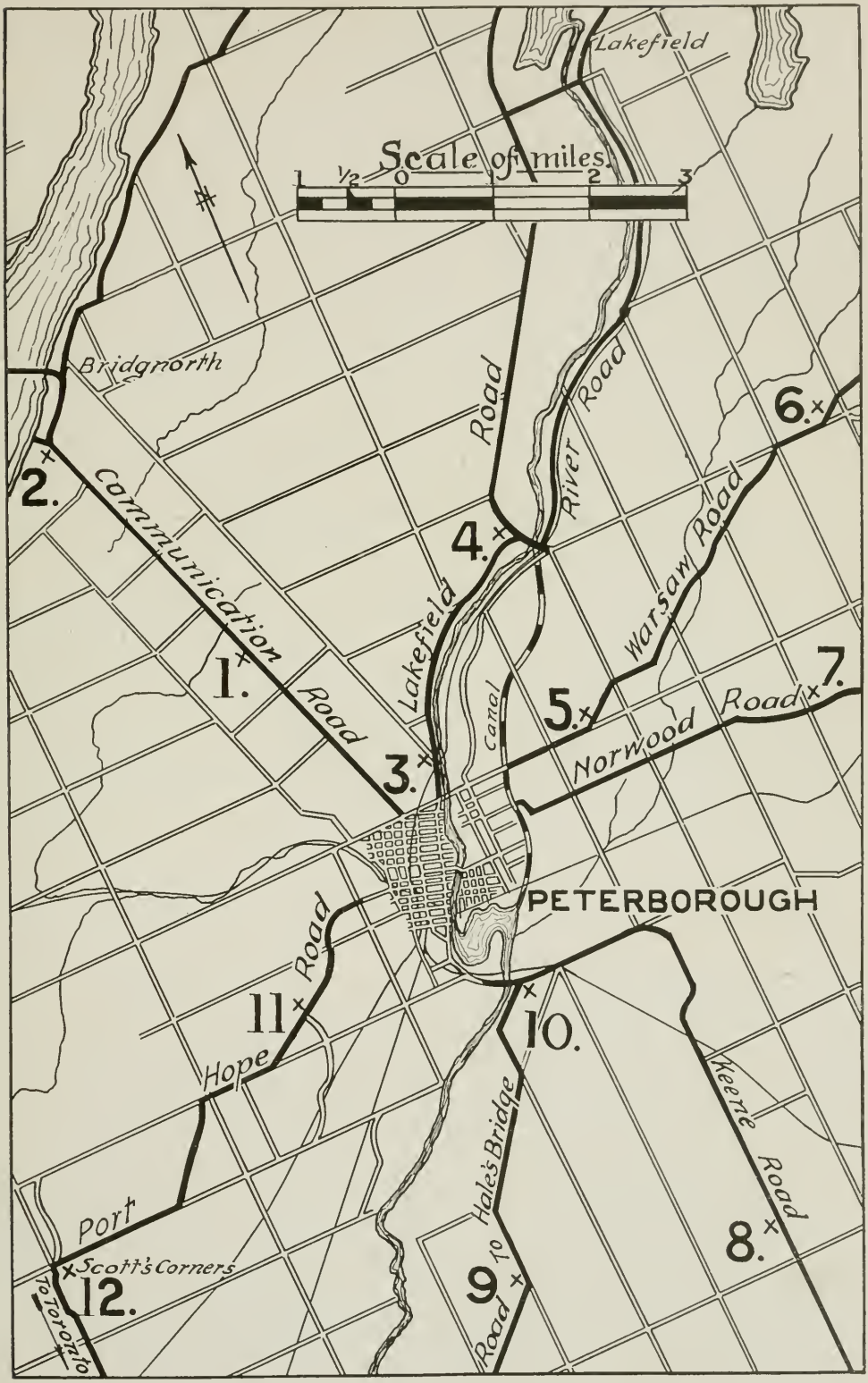
Census was taken from Monday, August 31, to Sunday, Sept. 6, inclusive. The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Communication Road	2	3 and 6 miles.
2	Lakefield Road	2	¼ and 3½ miles.
3	River Road	1	3½ miles.
4	Warsaw Road	2	1½ and 6 miles.
5	Norwood Road	1	5 miles.
6	Keene Road	2	½ and 5½ miles.
7	Road to Hale's Bridge	2	½ and 4 miles.
8	Port Hope Road	2	2½ and 6 miles.
		14 (represented by 12 stations on map)	

Lakefield Road is the heaviest travelled road, with heavy teaming from gravel pits located half a mile from the city limits; there is also a large amount of traffic to and from the city waterworks situated on the river bank about two miles from the city limits.

In summer months there is a heavy motor car traffic on Communication Road, to and from pleasure parks on Lake Chemong.

The roads adjacent to the city are built of gravel, and the majority are in very poor condition.


Lakefield
Scale of miles
1 ½ 0 2 3
Bridgnorth
2.
Communication Road
1.
Lakefield Road
4.
River Road
6.
Warsaw Road
7.
5.
Norwood Road
3.
Canal
PETERBOROUGH
11
Hope Road
10.
Hale's Bridge
Keene Road
8.
Port
Scott's Corners
12.
To Toronto
9
To Road

COMMUNICATION ROAD—Station No. 1—Lot 6, Concession III, Smith Township.

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Shwry	Wed. Fair	Thur. Fine	Fri. Fair	Sat. Shwry	Sun. Rain	Total	Daily Average
One horse light vehicle.....	80	41	130	63	59	57	50	480	68.6
One horse heavy vehicle.....	22	.....	10	12	14	14	14	86	12.3
Two horse light vehicle.....	10	1	19	8	8	15	14	75	10.7
Two horse heavy vehicle.....	20	.....	12	13	16	25	5	91	13.0
Runabout	3	3	3	.....	2	2	1	14	2.0
Touring Car.....	53	26	44	35	39	41	24	262	37.4
Motor Truck.....	3	.....	.....	2	1	2	2	10	1.4
Total	191	71	218	133	139	156	110	1,018	145.4

Condition of Road:—Gravel road, solid, but very rough.
Remarks:—In summer months there is quite a lot of traffic to and from pleasure parks located 6 miles out from the city, on Lake Chemong.

COMMUNICATION ROAD—Station No. 2—Junction of Road to Pleasure Park.

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Shwry	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Rain	Sun. Fair	Total	Daily Average
One horse light vehicle.....	55	34	49	33	105	84	18	378	54.0
One horse heavy vehicle.....	28	13	21	16	16	3	16	113	16.1
Two horse light vehicle.....	7	3	6	1	3	.....	1	21	3.0
Two horse heavy vehicle.....	22	15	31	33	34	.....	23	158	22.6
Runabout	1	2	2	1	1	.....	2	9	1.3
Touring Car.....	50	24	40	30	45	19	40	248	35.4
Motor Truck.....	.....	1	.....	.....	.....	.....	.....	1	0.1
Total	163	92	149	114	204	106	100	928	132.5

Condition of Road:—Gravel road, solid, but very rough.

LAKEFIELD ROAD—Station No. 3—Lot 16, Concession I, Smith Township.

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Rain	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Rain	Total	Daily Average
One horse light vehicle.....	79	56	69	81	64	161	53	583	83.3
One horse heavy vehicle.....	36	28	33	19	26	49	4	195	27.8
Two horse light vehicle.....	2	5	5	.....	3	10	1	26	3.7
Two horse heavy vehicle.....	77	73	114	95	111	86	.....	556	79.4
Runabout	6	8	3	1	4	11	4	37	5.3
Touring Car.....	21	13	21	18	18	51	21	143	20.4
Motor Truck.....	.....	.....	.....	.....	1	.....	.....	1	0.2
Total	221	183	245	214	227	368	83	1,541	220.1

Condition of Road:—Gravel road, with loose stones on surface, very rough.
Remarks:—Heavy teaming to and from gravel pits.

LAKEFIELD ROAD—Station No. 4—West of Nassau Bridge (Junction of River Road).

Including traffic from River Road.

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Rain	Wed. Fine	Thur. Rain	Fri. Shwry	Sat. Fine	Sun. Rain	Total	Daily Average
One horse light vehicle	43	32	58	45	36	71	24	309	44.1
One horse heavy vehicle	4	8	3	8	4	14	2	43	6.1
Two horse light vehicle	.....	.....	2	.....	3	3	1	9	1.3
Two horse heavy vehicle	10	11	7	11	7	16	.....	62	8.9
Runabout	.....	1	3	2	2	3	2	13	1.8
Touring Car	22	3	10	15	10	24	13	97	13.9
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	79	55	83	81	62	131	42	533	76.1

Condition of Road:—Gravel road, very rough.

LAKEFIELD ROAD—Station No. 4—West of Nassau Bridge (Junction of River Road).

Excluding traffic from River Road.

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Rain	Wed. Fine	Thur. Rain	Fri. Shwry	Sat. Fine	Sun. Rain	Total	Daily Average
One horse light vehicle	30	18	34	27	19	47	8	183	26.1
One horse heavy vehicle	3	5	3	7	2	8	2	30	4.2
Two horse light vehicle	.....	.....	2	.....	2	3	1	8	1.2
Two horse heavy vehicle	6	11	5	11	7	13	.....	53	7.6
Runabout	.....	1	3	1	1	3	1	10	1.4
Touring Car	17	2	9	10	8	23	10	79	11.3
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	56	37	56	56	39	97	22	363	51.8

Condition of Road:—Gravel road, solid, but very rough.

RIVER ROAD—Station No. 4—West of Nassau Bridge (Junction of Lakefield Road).

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Rain	Wed. Fine	Thur. Rain	Fri. Shwry	Sat. Fine	Sun. Rain	Total	Daily Average
One horse light vehicle	13	14	24	18	17	24	16	126	18.0
One horse heavy vehicle	1	3	.....	1	2	6	.....	13	1.9
Two horse light vehicle	.....	.....	.....	.....	1	.....	.....	1	0.1
Two horse heavy vehicle	4	.....	2	.....	.....	3	.....	9	1.3
Runabout	.....	.....	.....	1	1	.....	1	3	0.4
Touring Car	5	1	1	5	2	1	3	18	2.6
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	23	18	27	25	23	34	20	170	24.3

Condition of Road:—Gravel road, very rough.

WARSAW ROAD—Station No. 5—Junction of Town Line Road.

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fair	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Rain	Total	Daily Average
One horse light vehicle	34	29	28	18	20	90	20	239	34.2
One horse heavy vehicle	1	.....	4	3	4	5	.....	17	2.4
Two horse light vehicle	2	2	2	.....	4	8	.....	18	2.6
Two horse heavy vehicle	11	7	4	19	8	14	.....	63	9.0
Runabout	.....	.....	1	.....	.....	.....	.....	1	0.1
Touring Car	5	5	7	4	9	4	.....	34	4.9
Motor Truck	.....	2	2	.....	.....	6	3	13	1.8
Total	53	45	48	44	45	127	23	385	55.0

Condition of Road:—Gravel road, very rough.

WARSAW ROAD—Station No. 6—Junction of Road to Nassau Mills.

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Rain	Wed. Fair	Thur. Fair	Fri. Cloudy	Sat. Fair	Sun. Fair	Total	Daily Average
One horse light vehicle	23	15	17	14	25	63	41	198	28.3
One horse heavy vehicle	7	9	12	7	6	7	.....	48	6.8
Two horse light vehicle	2	1	.....	.....	5	2	.....	10	1.4
Two horse heavy vehicle	11	6	8	14	4	14	.....	57	8.2
Runabout	.....	.....	.....	.....	.....	.....	2	2	0.3
Touring Car	3	5	7	5	6	3	3	32	4.6
Motor Truck	.....	2	.....	.....	.....	2	.....	4	0.5
Total	46	38	44	40	46	91	46	351	50.1

Condition of Road:—Gravel road, very rough.

NORWOOD ROAD—Station No. 7—Lot 30, Concession VII, Otonabee Township.

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Rain	Tues. Rain	Wed. Fair	Thur. Rain	Fri. Fair	Sat. Fine	Sun. Rain	Total	Daily Average
One horse light vehicle	37	28	25	17	24	85	47	263	37.6
One horse heavy vehicle	2	.....	2	.....	1	.....	.....	5	0.8
Two horse light vehicle	4	1	2	2	2	9	.....	20	2.8
Two horse heavy vehicle	19	7	5	10	10	8	.....	59	8.4
Runabout	.....	1	.....	.....	3	.....	.....	4	0.5
Touring Car	9	10	2	7	7	6	1	42	6.0
Motor Truck	2	.....	1	.....	1	.....	.....	4	0.6
Total	73	47	37	36	48	108	48	397	56.7

Condition of Road—Gravel road, loose and very rough.

KEENE ROAD—Station No. 10—Junction of Road to Hale's Bridge.

Including traffic from Hale's Bridge Road

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Rain	Tues. Fair	Wed. Fair	Thur. Fair	Fri. Cloudy	Sat. Fine	Sun. Rain	Total	Daily Average
One horse light vehicle	85	112	96	112	114	159	119	797	113.8
One horse heavy vehicle	64	67	72	56	60	90	18	427	61.0
Two horse light vehicle	17	17	9	5	12	26	13	99	14.1
Two horse heavy vehicle	24	31	25	22	39	25	.....	166	23.7
Runabout	5	4	2	2	2	6	.....	21	3.0
Touring Car	12	19	28	25	42	33	13	172	24.6
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	207	250	232	222	269	339	163	1,682	240.2

Condition of Road:—Gravel road, solid, but very rough.

KEENE ROAD—Station No. 10—Junction of Road to Hale's Bridge.

Excluding traffic from Hale's Bridge Road.

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Rain	Tues. Fair	Wed. Fair	Thur. Fair	Fri. Cloudy	Sat. Fine	Sun. Rain	Total	Daily Average
One horse light vehicle	30	52	41	44	39	45	69	320	45.7
One horse heavy vehicle	22	19	21	23	17	21	5	128	18.3
Two horse light vehicle	7	4	.....	2	2	11	12	38	5.4
Two horse heavy vehicle	11	10	16	9	17	12	.....	75	10.7
Runabout	4	2	2	2	.....	5	.....	15	2.1
Touring Car	8	7	14	15	17	18	11	90	12.9
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	82	94	94	95	92	112	97	666	95.1

Condition of Road:—Stone road, very rough.

KEENE ROAD—Station No. 8—North of Graystock.

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Rain	Wed. Fair	Thur. Shwry	Fri. Fair	Sat. Fine	Sun. Fine	Total	Daily Average
One horse light vehicle	25	32	49	23	34	105	64	332	47.7
One horse heavy vehicle	8	8	7	6	5	28	.....	62	8.8
Two horse light vehicle	4	2	7	5	11	29	10	68	9.7
Two horse heavy vehicle	3	4	13	19	18	33	.....	90	12.8
Runabout	3	2	3	2	5	9	5	29	4.1
Touring Car	6	9	9	9	19	36	12	100	14.1
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	649	57	88	64	92	240	91	681	97.2

Condition of Road:—Stone road, very rough.

ROAD TO HALE'S BRIDGE—Station No. 10—Junction of Keene Road.

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Rain	Tues. Fair	Wed. Fair	Thur. Fair	Fri. Cloudy	Sat. Fine	Sun. Rain	Total	Daily Average
One horse light vehicle	55	60	55	68	75	114	50	477	68.1
One horse heavy vehicle	42	48	51	33	43	69	13	299	42.7
Two horse light vehicle	10	13	9	3	10	15	1	61	8.7
Two horse heavy vehicle	13	21	9	13	22	13	.....	91	13.0
Runabout	1	2	.....	.....	2	1	.....	6	0.9
Touring Car	4	12	14	10	25	15	2	82	11.7
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	125	156	138	127	177	227	66	1,016	145.1

Condition of Road:—Stone road, solid, but very rough.

ROAD TO HALE'S BRIDGE—Station No. 9—Junction of XIV. Concession Road, (Lot 19).

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Rain	Wed. Fair	Thur. Rain	Fri. Fine	Sat. Fine	Sun. Rain	Total	Daily Average
One horse light vehicle	13	19	12	9	16	34	21	124	17.8
One horse heavy vehicle	7	6	2	3	2	12	.....	32	4.6
Two horse light vehicle	8	4	5	2	4	6	1	30	4.2
Two horse heavy vehicle	5	10	5	5	6	6	.....	37	5.2
Runabout	2	1	1	.....	.....	3	1	8	1.1
Touring Car	4	.....	4	2	2	2	2	16	2.3
Motor Truck	1	.....	.....	.....	2	.....	.....	3	0.5
Total	40	40	29	21	32	63	25	250	35.7

Condition of Road:—Stone road, solid, but very rough.

PORT HOPE ROAD—Station No. 11—Lot 10, Concession 12, Monaghan Township.

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fine	Tues. Fair	Wed. Rain	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Cloudy	Total	Daily Average
One horse light vehicle	41	44	36	38	29	83	40	311	44.4
One horse heavy vehicle	5	14	17	25	23	47	5	136	19.4
Two horse light vehicle	10	9	3	3	5	19	1	50	7.2
Two horse heavy vehicle	22	10	18	25	17	23	.....	115	16.5
Runabout	2	2	.....	.....	2	3	4	13	1.8
Touring Car	19	9	20	13	13	44	28	146	20.8
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	99	88	94	104	89	219	78	771	110.1

Condition of Road:—Stone road, very rough and full of holes.

PORT HOPE ROAD—Station No. 12—Scott's Corners.

Monday, August 31, to Sunday, September 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Rain	Tues. Fair	Wed. Rain	Thur. Shwry	Fri. Fair	Sat. Fine	Sun. Rain	Total	Daily Average
One horse light vehicle	18	28	23	15	50	38	32	204	29.2
One horse heavy vehicle	.....	7	5	2	.....	6	.....	20	2.8
Two horse light vehicle	4	2	5	3	4	16	5	39	5.6
Two horse heavy vehicle	4	4	7	1	.....	10	9	35	5.0
Runabout	1	3	1	.....	4	4	.....	13	1.9
Touring Car	18	9	14	7	22	35	6	111	15.8
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	45	53	55	28	80	109	52	422	60.3

Condition of Road:—Stone road, solid, but very rough.

Windsor.

Census was taken from Thursday, July 30, to Wednesday, August 5, inclusive. The following roads were taken into consideration:—

Name of Road.	Number of Stations.	Distance from City Limits.
1 Tecumseh Road	2	½ and 3½ miles.
2 Talbot Road	2	2½ and 6 miles.
3 River Road	1	5½ miles.
	5	

There are a few places of importance which cause a certain amount of local traffic on roads, viz.: Ojibwa, Oldcastle and Sandwich.

The Walker Farm is the chief factor of the heavy traffic on first mile of Tecumseh Road.

The River Road carries a great deal of pleasure motor traffic after 7 p.m. Within a year or so the new concrete roadway through Ojibwa will be completed and the traffic then will be more than doubled.

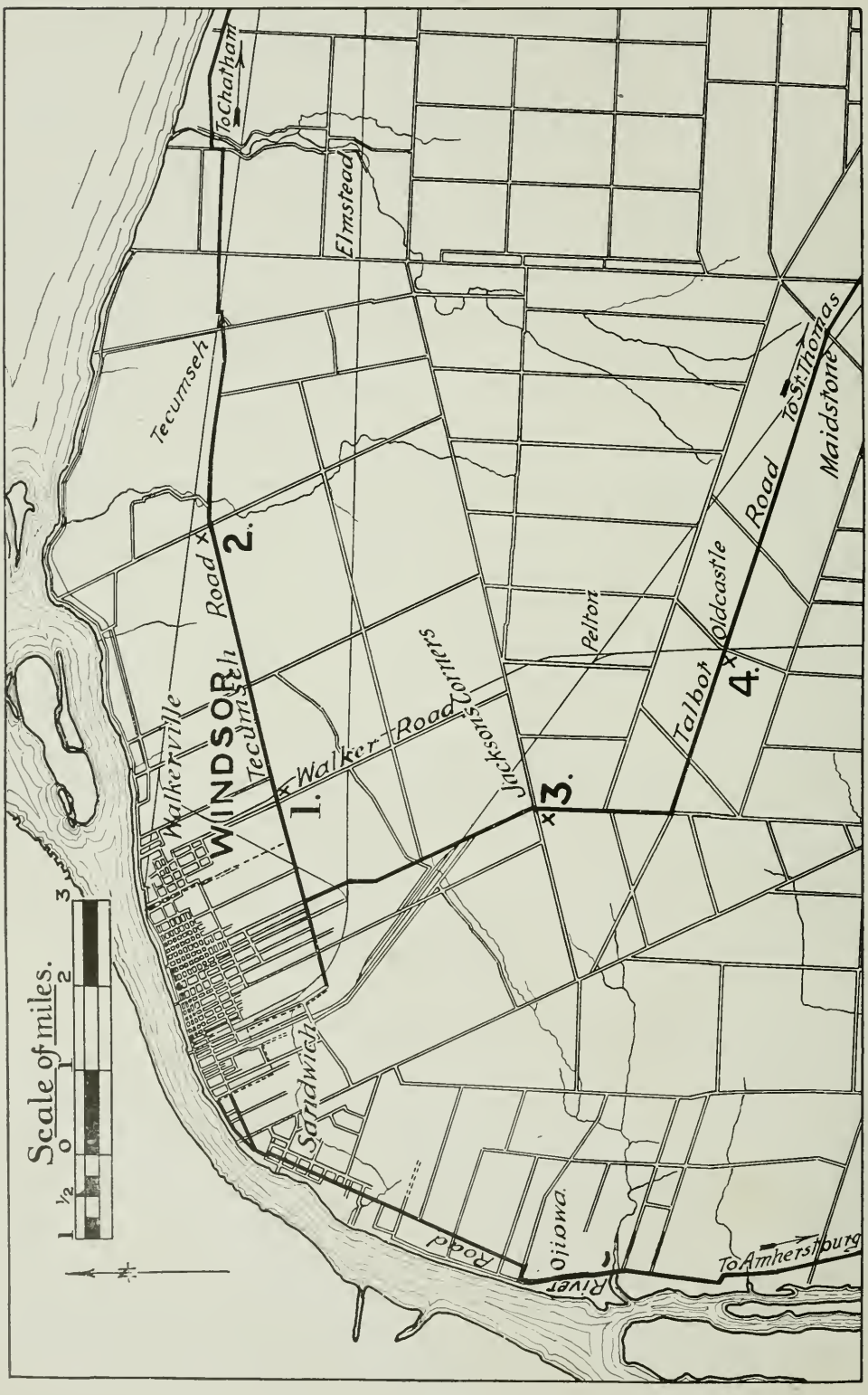
The roads are of clay, very rough, and in wet weather are almost impassable.

TECUMSEH ROAD—Station No. 1—West of Walker Road

Thursday, July 30, to Wednesday, August 5, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Cloudy	Mon. Cloudy	Tues. Fair	Wed. Fair	Total	Daily Average
One horse light vehicle	67	76	150	66	67	89	53	568	81.1
One horse heavy vehicle	66	34	44	12	23	25	47	251	35.9
Two horse light vehicle	4	8	16	.....	3	6	7	44	6.3
Two horse heavy vehicle	118	121	75	6	100	91	165	676	96.6
Runabout	26	12	9	9	8	5	10	79	11.3
Touring Car	63	41	37	78	63	54	33	369	52.7
Motor Truck	7	7	12	.....	3	3	10	42	6.0
Total	351	299	343	171	267	273	325	2,029	289.9

Condition of Road:— Clay road, in poor condition.
Remarks:—The two-horse heavy vehicle traffic is to and from the Walker Farm.


To Chatham
Elmstead
Tecumseh
Road
2.
WINDSOR
Walkerville
Tecumseh
Walker Road
1.
Jacksons Corners
Pelton
3.
Talbot Road
Oldcastle
4.
To St. Thomas
Maidstone
Sandwich
Road
Ojiowa
River
To Amherstburg
Scale of miles.
1 ½ 0 1 2 3

TECUMSEH ROAD—Station No. 2—Junction of Lauzon Road

Thursday, July 30, to Wednesday, August 5, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fair	Sat. Cloudy	Sun. Cloudy	Mon. Fair	Tues. Fair	Wed. Foggy	Total	Daily Average
One horse light vehicle.....	70	67	76	62	66	54	41	436	62.3
One horse heavy vehicle.....	17	21	26	19	14	18	12	127	18.1
Two horse light vehicle.....	30	12	14	15	10	31	25	137	19.6
Two horse heavy vehicle.....	32	19	19	21	21	26	11	149	21.3
Runabout	12	10	10	8	10	14	9	73	10.4
Touring Car.....	52	40	26	51	37	38	30	274	39.1
Motor Truck.....	4	2	3	.....	2	4	2	17	2.4
Total	217	177	174	176	160	185	130	1,213	173.2

Condition of Road:—Clay road, in poor condition.

TALBOT ROAD—Station No. 3—Jackson's Corners.

Thursday, July 30, to Wednesday, August 5, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Cloudy	Mon. Fair	Tues. Fair	Wed. Fair	Total	Daily Average
One horse light vehicle.....	56	42	90	74	53	42	67	424	60.5
One horse heavy vehicle.....	21	29	40	4	22	21	34	171	24.4
Two horse light vehicle.....	1	.....	.....	2	.....	.....	.....	3	0.5
Two horse heavy vehicle.....	26	18	37	6	30	30	35	182	26.0
Runabout	16	5	7	24	12	6	9	79	11.3
Touring Car.....	98	62	136	123	64	68	63	614	87.8
Motor Truck.....	3	2	3	.....	5	6	4	23	3.2
Total	221	158	313	233	186	173	212	1,496	213.7

Condition of Road:—Gravel road, in poor condition.

TALBOT ROAD—Station No. 4—Oldcastle.

Thursday, July 30, to Wednesday, August 5, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Cloudy	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fine	Wed. Fine	Total	Daily Average
One horse light vehicle.....	19	24	16	17	24	7	8	115	16.4
One horse heavy vehicle.....	6	1	2	.....	1	3	3	16	2.3
Two horse light vehicle.....	1	1	3	2	1	1	.....	9	1.3
Two horse heavy vehicle.....	10	9	14	.....	10	7	11	61	8.7
Runabout	18	2	7	47	2	7	5	88	12.6
Touring Car.....	68	48	90	133	48	54	56	497	71.0
Motor Truck.....	2	2	4	.....	2	4	5	19	2.7
Total	124	87	136	199	88	83	88	805	115.0

Condition of Road:—Gravel road, in fair condition.

RIVER ROAD—Station No. 5—Turkey Creek.

Thursday, July 30, to Wednesday, August 5, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Cloudy	Sat. Fair	Sun. Cloudy	Mon. Fair	Tues. Fair	Wed. Fair	Total	Daily Average
One horse light vehicle	105	74	101	27	58	85	90	540	77.1
One horse heavy vehicle	48	59	15	4	51	40	52	269	38.4
Two horse light vehicle	9	15	7	2	5	9	7	54	7.7
Two horse heavy vehicle	6	15	5	.....	5	7	8	46	6.6
Runabout	5	13	5	8	9	4	4	48	6.9
Touring Car	53	35	67	142	108	49	43	497	71.0
Motor Truck	4	5	5	.....	3	6	9	32	4.6
Total	230	216	205	183	239	200	213	1,486	212.3

Condition of Road:—Clay road, in poor condition.

Berlin.

Census was taken from Tuesday, August 11, to Monday, August 17, inclusive. The following roads were taken into consideration.

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Breslau Road	1	4 miles.
2	Bridgeport Road	1	1½ miles.
3	Erbs Road	1	2 miles.
4	Waterloo Road	1	4½ miles.
5	Petersburg Road	1	4 miles.
6	New Dundee Road	1	2½ miles.
7	Galt Road	2	1 and 2½ miles.
		8	

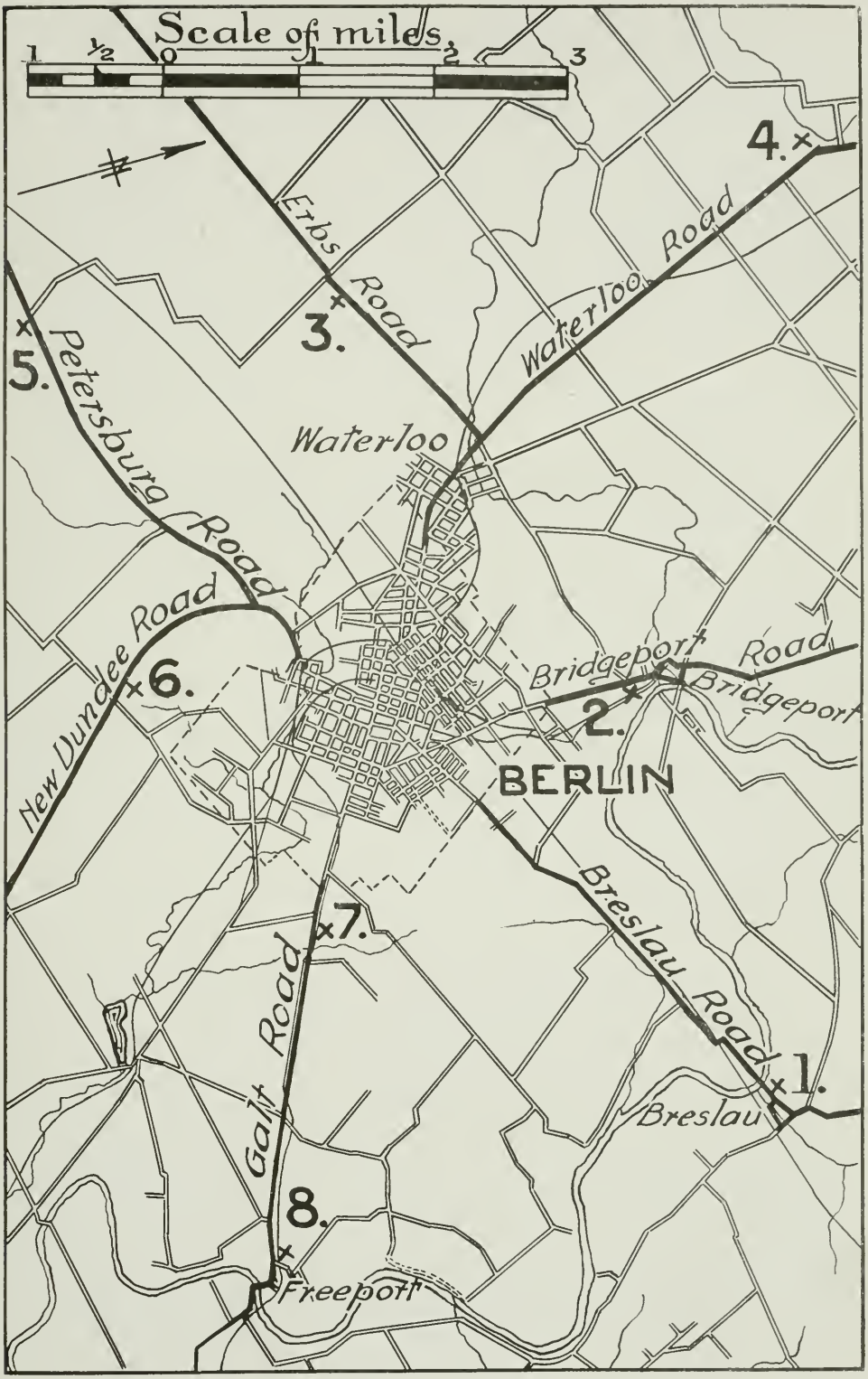
The town of Waterloo joins the city on the north, which would account for a certain amount of traffic on the Waterloo and Erbs Roads.

Around the city are the following places of importance: Galt, Preston, Hespeler and Breslau. These cause a large amount of local traffic on the roads.

At the village of Bridgeport, about two miles from the city, are located sugar refineries; the traffic from these is excessive, as is shown in the schedule under Station 2. This traffic, as well as traffic from a stone quarry located about one mile from the city limits, uses the Bridgeport Road.

The Galt Road, surface treated with tar, is very heavily travelled after 7 p.m. by motorists from Galt, Preston and Berlin.

The roads adjacent to the city are in fair condition, with the exception of the first 1½ miles of Bridgeport Road, which is badly cut up.


Scale of miles
1 ½ 0 1 2 3
Erbs Road
Waterloo Road
Petersburg Road
New Dundee Road
Bridgeport Road
Bridgeport
Waterloo
BERLIN
Breslau Road
Breslau
Galt Road
Freeport
1.
2.
3.
4.
5.
6.
7.
8.

BRESLAU ROAD—Station No. 1—Breslau.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Cloudy	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Fair	Sun. Cloudy	Mon. Cloudy	Total	Daily Average
One horse light vehicle	41	33	32	34	95	64	42	341	48.7
One horse heavy vehicle	7	33	15	33	55	14	30	187	26.7
Two horse light vehicle	.....	.....	.....	3	7	8	3	21	3.0
Two horse heavy vehicle	6	9	23	10	22	.....	21	91	13.0
Runabout	10	9	4	5	7	6	5	46	6.6
Touring Car	24	36	19	21	52	62	42	256	36.6
Motor Truck	3	1	5	3	2	1	8	23	3.3
Total	91	121	98	109	240	155	151	965	137.9

Condition of Road:—Stone road, rough, and badly cut up in places.

BRIDGEPORT ROAD—Station No. 2—Bridgeport.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Cloudy	Wed. Fair	Thur. Rain	Fri. Fair	Sat. Fair	Sun. Rain	Mon. Fair	Total	Daily Average
One horse light vehicle	97	97	68	100	184	96	81	723	103.3
One horse heavy vehicle	32	25	17	29	32	4	18	157	22.4
Two horse light vehicle	8	15	7	10	17	.....	9	66	9.4
Two horse heavy vehicle	347	343	342	285	161	6	153	1,637	233.9
Runabout	4	9	1	5	2	6	5	32	4.6
Touring Car	37	54	21	30	41	59	38	280	40.0
Motor Truck	1	3	2	2	.....	.....	1	9	1.3
Total	526	546	458	461	437	171	305	2,904	414.9

Condition of Road:—Stone road, badly cut up.
Remarks:—Excessive traffic from stone quarry, and also from Dominion Sugar Refineries located at Bridgeport.

ERBS ROAD—Station No. 3—Town Limits of Waterloo.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Rain	Mon. Fair	Total	Daily Average
One horse light vehicle	46	44	61	71	106	68	38	434	62.0
One horse heavy vehicle	11	5	5	11	5	2	9	48	6.9
Two horse light vehicle	3	5	6	14	22	13	4	67	9.6
Two horse heavy vehicle	14	11	12	17	13	.....	18	85	12.1
Runabout	6	4	1	.....	.....	3	4	18	2.6
Touring Car	12	10	5	19	18	20	13	97	13.8
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	92	79	90	132	164	106	86	749	107.0

Condition of Road:—Stone road, very rough.

WATERLOO ROAD—Station No. 4—West of Heidelburg Station.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Cloudy	Wed. Fair	Thur. Rain	Fri. Cloudy	Sat. Fair	Sun. Fair	Mon. Fair	Total	Daily Average
One horse light vehicle	31	18	29	19	46	28	23	194	27.7
One horse heavy vehicle	5	1	3	1	.....	.....	6	16	2.3
Two horse light vehicle	4	7	4	6	6	2	1	30	4.3
Two horse heavy vehicle	6	11	7	7	5	.....	8	44	6.3
Runabout	5	3	5	9	5	6	6	39	5.6
Touring Car	27	31	19	23	39	44	27	210	30.0
Motor Truck	2	2	.....	.....	.....	.....	.....	4	0.6
Total	80	73	67	65	101	80	71	537	76.8

Condition of Road:—Stone road, in good condition.

PETERSBURG ROAD—Station No. 5—Lot 1, S.S.R. Wilnot Township.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fine	Thur. Rain	Fri. Fair	Sat. Fair	Sun. Rain	Mon. Fine	Total	Daily Average
One horse light vehicle	23	30	8	20	64	28	19	192	27.4
One horse heavy vehicle	.....	2	2	4	.....	.....	4	12	1.7
Two horse light vehicle	2	4	4	5	11	5	.....	31	4.4
Two horse heavy vehicle	5	7	9	14	14	.....	11	60	8.6
Runabout	3	6	4	3	5	1	5	27	3.9
Touring Car	19	13	19	24	30	45	32	182	26.0
Motor Truck	.....	1	3	.....	.....	.....	.....	4	0.6
Total	52	63	49	70	124	79	71	508	72.6

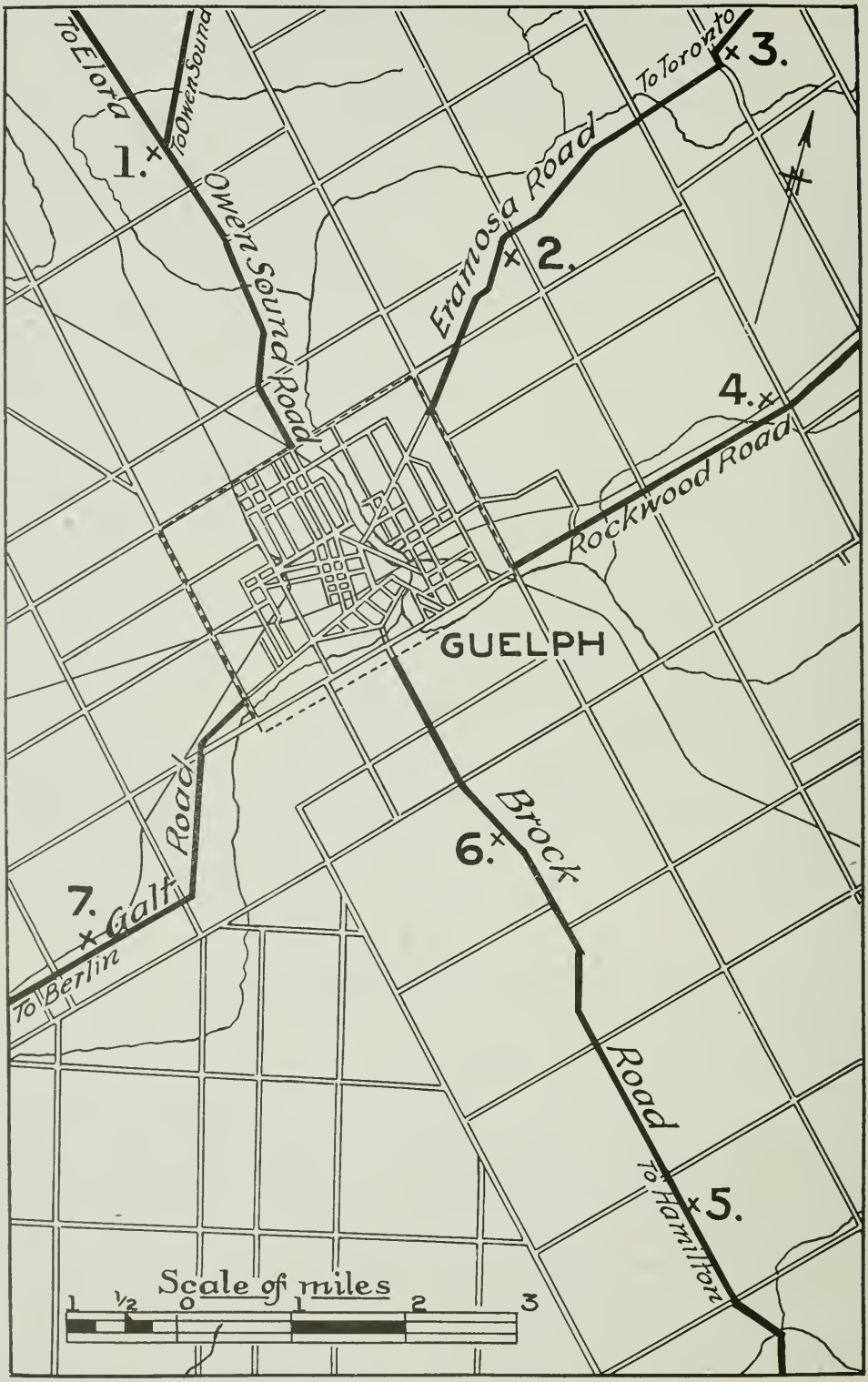
Condition of Road:—Stone road, rough in parts.

NEW DUNDEE ROAD—Station No. 6—Junction of Road from Doon.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Rain	Mon. Fair	Total	Daily Average
One horse light vehicle	34	45	39	58	171	56	47	450	64.3
One horse heavy vehicle	3	6	.....	5	2	.....	.....	16	2.3
Two horse light vehicle	.....	8	3	6	43	6	6	72	10.3
Two horse heavy vehicle	21	11	5	6	7	1	15	66	9.4
Runabout	2	3	1	2	2	.....	2	12	1.7
Touring Car	11	9	2	3	24	20	10	79	11.3
Motor Truck	.....	1	.....	.....	1	.....	.....	2	0.3
Total	71	83	50	80	250	83	80	697	99.6

Condition of Road:—Stone road, rough in parts.


To Elora
To Owen Sound
1.
Owen Sound Road
Eramosa Road
2.
To Toronto
3.
4.
Rockwood Road
GUELPH
Brock Road
6.
5.
To Hamilton
7.
Galt Road
To Berlin
Scale of miles
1 ½ 0 1 2 3

GALT ROAD—Station No. 7—Junction of Doon Road.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Fine	Thur. Rain	Fri. Rain	Sat. Fine	Sun. Rain	Mon. Fair	Total	Daily Average
One horse light vehicle.....	75	55	62	45	129	127	98	591	84.4
One horse heavy vehicle.....	14	15	13	12	13	.....	23	90	12.9
Two horse light vehicle.....	10	11	11	4	18	5	11	70	10.0
Two horse heavy vehicle.....	19	41	29	30	17	.....	26	162	23.1
Runabout	10	9	6	16	7	12	10	70	10.0
Touring Car.....	46	56	52	61	61	83	55	414	59.1
Motor Truck.....	4	3	1	2	4	1	3	18	2.6
Total	178	190	174	170	249	228	226	1,415	202.1

Condition of Road:—Stone road, in good condition.
Remarks:—This road is used more by motorists after 7 p.m. than during the day.

GALT ROAD—Station No. 8—Freeport.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Shwry	Mon. Fair	Total	Daily Average
One horse light vehicle.....	25	6	17	6	30	24	27	135	19.3
One horse heavy vehicle.....	12	8	6	10	15	2	3	56	8.0
Two horse light vehicle.....	1	2	1	.....	2	1	3	10	1.4
Two horse heavy vehicle.....	7	5	9	11	7	.....	8	47	6.7
Runabout	14	4	6	9	6	4	5	48	6.8
Touring Car.....	21	22	16	31	40	69	27	226	32.3
Motor Truck.....	.....	.....	1	2	1	.....	2	6	.9
Total	80	47	56	69	101	100	75	528	75.4

Condition of Road:—Stone road, in good condition.

Guelph.

Census was taken from Monday, August 10, to Sunday, August 16, inclusive. The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Owen Sound Road	1	3 miles.
2	Elora Road	1	3 miles.
3	Eramosa Road	2	2 and 4 miles.
4	Rockwood Road	1	3½ miles.
5	Brock Road	2	1½ and 5 miles.
6	Galt Road	1	3 miles.
		8	(represented by 7 stations on map).

While census was being taken, a bridge was down on Eramosa Road, about 3½ miles from city limits, and a temporary road was made for traffic; this was dangerous to motor vehicles, and would account for so little of such traffic on this road.

The roads adjacent to the city are all built of stone or gravel and are in fair condition, with exception of a part of Brock Road at College Hill, which is badly cut up.

OWEN SOUND ROAD—Station No. 1—Junction of Elora Road.

Including traffic from Elora Road.

Monday, August 10, to Sunday, August 16, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Shwry	Fri. Fine	Sat. Cloudy	Sun. Fair	Total	Daily Average
One horse light vehicle.....	47	44	39	20	59	90	59	358	51.2
One horse heavy vehicle.....	6	4	4	11	7	6	.....	38	5.4
Two horse light vehicle.....	7	2	3	3	9	2	2	28	4.0
Two horse heavy vehicle.....	12	5	9	8	23	14	1	72	10.3
Runabout	8	6	4	2	4	4	4	32	4.6
Touring Car.....	37	33	31	26	37	31	60	255	36.4
Motor Truck.....	1	2	.....	1	1	1	.....	6	0.8
Total	118	96	90	71	140	148	126	789	112.7

Condition of Road:—Stone road, in fair condition.

OWEN SOUND ROAD—Station No. 1—Junction of Elora Road.

Excluding traffic from Elora Road.

Monday, August 10, to Sunday, August 16, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Shwry	Fri. Fine	Sat. Cloudy	Sun. Fair	Total	Daily Average
One horse light vehicle.....	12	12	17	8	22	35	43	149	21.3
One horse heavy vehicle.....	4	3	4	5	4	2	.....	22	3.1
Two horse light vehicle.....	6	2	2	2	4	1	1	18	2.6
Two horse heavy vehicle.....	5	4	4	7	7	3	.....	30	4.3
Runabout	5	1	3	2	4	4	.....	19	2.7
Touring Car.....	16	19	18	8	25	9	33	128	18.3
Motor Truck.....	1	1	.....	.....	1	.....	.....	3	0.4
Total	49	42	48	32	67	54	77	369	52.7

Condition of Road:—Stone road, in good condition.

ELORA ROAD—Station No. 1—Junction of Owen Sound Road.

Monday, August 10, to Sunday, August 16, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Shwry	Fri. Fine	Sat. Cloudy	Sun. Fair	Total	Daily Average
One horse light vehicle.....	35	32	22	12	37	55	16	209	29.9
One horse heavy vehicle.....	2	1	.....	6	3	4	.....	16	2.3
Two horse light vehicle.....	1	.....	1	1	5	1	1	10	1.4
Two horse heavy vehicle.....	7	1	5	1	16	11	1	42	6.0
Runabout	3	5	1	.....	.....	.....	4	13	1.9
Touring Car.....	21	14	13	18	12	22	27	127	18.1
Motor Truck.....	.....	1	.....	1	.....	1	.....	3	0.4
Total	69	54	42	39	73	94	49	420	60.0

Condition of Road:—Stone road, in fair condition.

ERAMOSA ROAD—Station No. 2—Lot 5, Concession VII, Guelph Township.

Monday, August 10, to Sunday, August 16, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Cloudy	Tues. Fair	Wed. Fair	Thur. Rain	Fri. Fair	Sat. Fair	Sun. Fair	Total	Daily Average
One horse light vehicle	59	65	51	33	78	113	48	447	63.9
One horse heavy vehicle	3	12	8	9	5	4	.....	41	5.9
Two horse light vehicle	13	10	4	.....	3	18	1	49	7.0
Two horse heavy vehicle	3	10	16	12	11	10	.....	62	8.8
Runabout	5	4	5	1	6	1	3	25	3.6
Touring Car	16	19	23	21	16	28	22	145	20.7
Motor Truck	.....	.....	1	4	4	2	.....	11	1.6
Total	99	120	108	80	123	176	74	780	111.5

Condition of Road:—Stone road, very rough.

ERAMOSA ROAD—Station No. 3—Eramosa P.O.

Monday, August 10, to Sunday, August 16, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Rain	Fri. Fair	Sat. Fair	Sun. Rain	Total	Daily Average
One horse light vehicle	44	47	40	17	66	77	57	348	49.7
One horse heavy vehicle	3	13	3	5	8	3	1	36	5.1
Two horse light vehicle	7	5	3	2	2	12	.....	31	4.4
Two horse heavy vehicle	1	4	10	.....	11	7	.....	33	4.7
Runabout	5	.....	3	1	6	2	1	18	2.6
Touring Car	12	10	20	23	17	29	20	131	18.7
Motor Truck	.....	.....	2	3	4	4	.....	13	1.9
Total	72	79	81	51	114	134	79	610	87.1

Condition of Road:—Stone road, very rough.

ROCKWOOD ROAD—Station No. 4—Junction of Town Line Road.

Monday, August 10, to Sunday, August 16, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Cloudy	Sun. Cloudy	Total	Daily Average
One horse light vehicle	36	23	25	21	33	56	24	218	31.1
One horse heavy vehicle	4	7	5	5	12	14	.....	47	6.7
Two horse light vehicle	.....	1	.....	1	.....	.....	2	4	0.6
Two horse heavy vehicle	12	9	15	1	11	7	.....	55	7.9
Runabout	8	5	6	1	6	4	6	36	5.1
Touring Car	2	2	1	1	.....	5	9	20	2.9
Motor Truck	.....	.....	.....	.....	2	.....	.....	2	0.3
Total	62	47	52	30	64	86	41	382	54.6

Condition of Road:—Stone road, in fair condition.

BROCK ROAD—Station No. 6—Lot 2, Concession VIII, Puslinch Township.

Monday, August 10, to Sunday, August 16, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Rain	Tues. Fair	Wed. Fair	Thur. Rain	Fri. Fair	Sat. Fine	Sun. Rain	Total	Daily Average
One horse light vehicle.....	57	34	32	40	43	99	70	375	53.6
One horse heavy vehicle.....	13	15	23	13	13	22	6	105	15.0
Two horse light vehicle.....	16	4	4	5	12	16	6	63	9.0
Two horse heavy vehicle....	18	33	27	31	21	52	2	184	26.3
Runabout	2	5	8	3	2	3	7	30	4.3
Touring Car.....	29	26	29	22	38	39	48	231	33.0
Motor Truck.....	2	2	2	3	3	2	2	16	2.3
Total	137	119	125	117	132	233	141	1,004	143.5

Condition of Road:—Stone road, in fair condition. The section of road at College Hill is badly cut up.

BROCK ROAD—Station No. 5—Lot 17, Concession VIII, Puslinch Township.

Monday, August 10, to Sunday, August 16, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Rain	Tues. Fair	Wed. Fine	Thur. Rain	Fri. Fair	Sat. Fine	Sun. Fine	Total	Daily Average
One horse light vehicle.....	25	28	22	17	40	80	48	260	37.1
One horse heavy vehicle.....	5	4	2	8	.....	2	.....	21	3.0
Two horse light vehicle.....	10	3	15	14	21	36	2	101	14.4
Two horse heavy vehicle.....	15	29	16	9	2	11	.....	82	11.7
Runabout	5	.....	7	6	3	6	7	34	4.8
Touring Car.....	24	25	26	22	31	41	44	213	30.4
Motor Truck.....	2	.....	.....	3	3	2	3	13	1.8
Total	86	89	88	79	100	178	104	724	103.2

Condition of Road:—Stone road, in fair condition.

GALT ROAD—Station No. 7—Gourock.

Monday, August 10, to Sunday, August 16, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Cloudy	Sun. Rain	Total	Daily Average
One horse light vehicle.....	25	24	28	27	22	28	32	186	26.6
One horse heavy vehicle.....	5	11	3	3	10	16	2	50	7.1
Two horse light vehicle.....	4	6	.....	3	3	5	4	25	3.6
Two horse heavy vehicle.....	5	8	1	11	3	.....	.....	28	4.0
Runabout	1	4	1	.....	2	4	3	15	2.1
Touring Car.....	17	12	14	30	12	37	26	148	21.1
Motor Truck.....	.....	.....	1	.....	.....	4	.....	5	0.8
Total	57	65	48	74	52	94	67	457	65.3

Condition of Road:—Stone road, in fair condition.

St. Thomas.

Census was taken from Friday, August 14, to Thursday, August 20, inclusive. The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Talbot Road East	2	2½ and 4½ miles.
2	Port Stanley Road	2	2½ and 5 miles.
3	Talbot Road West	2	3 and 6 miles.
4	North Branch of Talbot Road	2	2½ and 4½ miles.
		8	

There is a heavy summer and pleasure traffic on Port Stanley Road, to and from Lake Erie.

On Talbot Road East, between the town of Aylmer and St. Thomas, there is a fairly heavy motor traffic; but this road is very rough in parts, and if improved would carry much heavier traffic. Two bridges were being built on this road while the census was taken; this caused a decrease from the normal amount of traffic.

The roads adjacent to the city are built of gravel and are very rough in parts. Port Stanley Road, however, is good.

TALBOT ROAD EAST—Station No. 1—Yarmouth.

Friday, August 14, to Thursday, August 20, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Cloudy	Sat. Fine	Sun. Rain	Mon. Fine	Tues. Fair	Wed. Fine	Thur. Rain	Total	Daily Average
One horse light vehicle	58	89	64	80	71	74	47	483	69.0
One horse heavy vehicle	29	64	6	23	33	40	18	213	30.4
Two horse light vehicle	25	26	.....	4	12	15	1	83	11.9
Two horse heavy vehicle	15	17	.....	10	20	18	19	99	14.2
Runabout	10	16	38	6	1	2	.....	73	10.4
Touring Car	30	59	70	61	21	28	14	283	40.4
Motor Truck	.....	3	.....	.....	1	.....	.....	4	0.6
Total	167	274	178	184	159	177	99	1,238	176.9

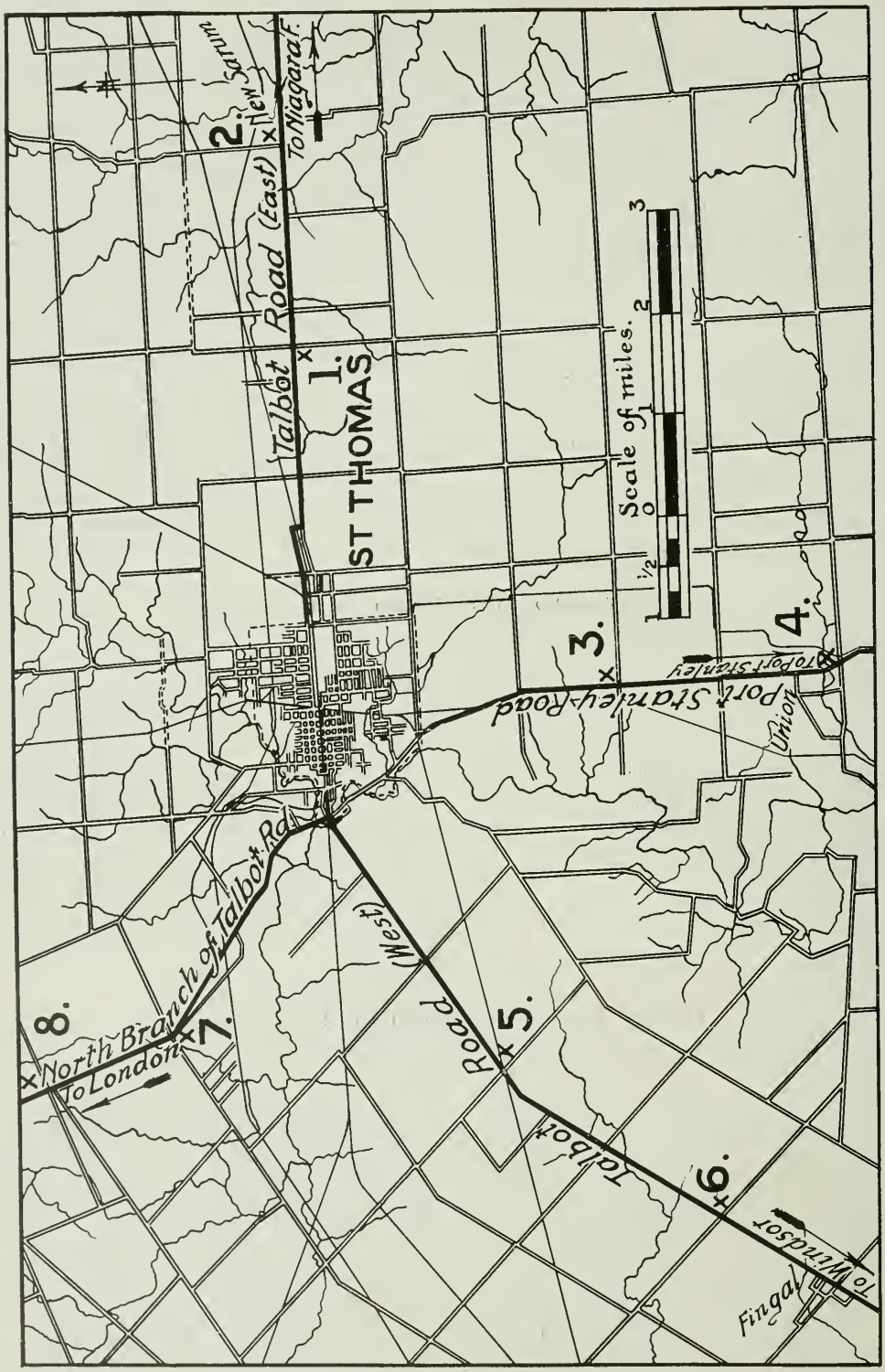
Condition of Road:—Gravel road, solid, but very rough.

TALBOT ROAD EAST—Station No. 2—New Sarum.

Friday, August 14, to Thursday, August 20, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Cloudy	Sun. Fair	Mon. Fair	Tues. Cloudy	Wed. Cloudy	Thur. Rain	Total	Daily Average
One horse light vehicle	41	70	70	56	60	77	39	413	59.0
One horse heavy vehicle	15	32	1	14	8	25	6	101	14.4
Two horse light vehicle	3	17	5	4	7	7	.....	43	6.2
Two horse heavy vehicle	18	17	.....	16	11	13	8	83	11.9
Runabout	11	9	15	9	.....	7	6	57	8.1
Touring Car	11	25	77	28	20	31	11	203	29.0
Motor Truck	.....	.....	.....	1	4	.....	.....	5	0.7
Total	99	170	168	128	110	160	70	905	129.3

Condition of Road:—Gravel road, solid, but very rough.


1.
ST THOMAS
2.
New Sarum
To Niagara F.
Talbot Road (East)
3.
Port Stanley Road
To Port Stanley
Union
4.
Scale of miles.
0
1
2
3
½
5.
Talbot Road (West)
6.
To Windsor
Tilbot
Fingal
7.
North Branch of Talbot Rd
To London
8.

PORT STANLEY ROAD—Station No. 3—Lot 4, Con. IV, Yarmouth Township

Friday, August 14, to Thursday, August 20, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fine	Sat. Fine	Sun. Rain	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Rain	Total	Daily Average
One horse light vehicle	40	32	32	28	40	37	25	234	33.4
One horse heavy vehicle	17	16	1	10	25	12	6	87	12.4
Two horse light vehicle	3	2	.....	7	2	5	6	25	3.6
Two horse heavy vehicle	46	45	.....	42	21	18	11	183	26.2
Runabout	5	9	16	5	3	9	.....	47	6.7
Touring Car	54	65	122	72	33	80	22	448	64.0
Motor Truck	.....	2	.....	1	.....	4	2	9	1.3
Total	165	171	171	165	124	165	72	1,033	147.6

Condition of Road:—Gravel road, in good condition.

PORT STANLEY ROAD—Station No. 4—South of Union, (Lot 4, Concession VI, Yarmouth Township).

Friday, August 14, to Thursday, August 20, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Fair	Sun. Rain	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Fine	Total	Daily Average
One horse light vehicle	36	43	36	17	37	43	37	249	35.6
One horse heavy vehicle	19	47	2	23	24	20	13	148	21.1
Two horse light vehicle	8	4	1	1	2	3	11	30	4.3
Two horse heavy vehicle	11	20	.....	27	17	10	13	98	14.0
Runabout	2	8	8	4	4	6	3	35	5.0
Touring Car	50	80	137	69	32	75	27	470	67.2
Motor Truck	.....	2	.....	1	.....	3	2	8	1.1
Total	126	204	184	142	116	160	106	1,038	148.4

Condition of Road:—Gravel road, in good condition.

TALBOT ROAD WEST—Station No. 5—Middlemarch.

Friday, August 14, to Thursday, August 20, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Fine	Sun. Cloudy	Mon. Fair	Tues. Cloudy	Wed. Fair	Thur. Rain	Total	Daily Average
One horse light vehicle	50	121	53	37	47	37	34	379	54.1
One horse heavy vehicle	9	20	4	5	10	14	7	69	9.9
Two horse light vehicle	2	11	5	.....	4	4	2	28	4.0
Two horse heavy vehicle	24	27	.....	26	20	29	9	135	19.3
Runabout	1	2	2	.....	1	2	.....	8	1.2
Touring Car	8	24	16	20	5	10	11	94	13.4
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	94	205	80	88	87	96	63	713	101.9

Condition of Road:—Gravel road, in fair condition.

TALBOT ROAD WEST—Station No. 6—Lot 24, N.T.R.E., Southwold Township.

Friday, August 14, to Thursday, August 20, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Fine	Total	Daily Average
One horse light vehicle	18	83	42	25	37	37	17	259	37.0
One horse heavy vehicle	2	.....	.....	.....	.....	.....	.....	2	0.3
Two horse light vehicle	7	16	4	6	9	6	2	50	7.1
Two horse heavy vehicle	21	15	.....	12	9	8	9	74	10.6
Runabout	1	10	4	11	2	.....	.....	28	4.0
Touring Car	5	20	17	18	4	8	4	76	10.9
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	54	144	67	72	61	59	32	489	69.9

Condition of Road:—Gravel road, in fair condition.

NORTH BRANCH OF TALBOT ROAD—Station No. 7—South of Talbotville (Lot B, S.T.R.N., Southwold Township).

Friday, August 14, to Thursday, August 20, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fine	Sat. Fine	Sun. Rain	Mon. Fine	Tues. Rain	Wed. Fine	Thur. Rain	Total	Daily Average
One horse light vehicle	53	129	38	31	40	30	44	365	52.1
One horse heavy vehicle	13	54	2	14	12	19	15	129	18.4
Two horse light vehicle	6	28	3	4	11	6	10	68	9.7
Two horse heavy vehicle	27	26	.....	10	18	16	18	115	16.4
Runabout	9	6	17	6	4	5	7	54	7.7
Touring Car	33	44	86	60	35	48	24	330	47.1
Motor Truck	2	5	.....	3	5	6	6	27	3.9
Total	143	292	146	128	125	130	124	1,088	155.3

Condition of Road:—Gravel road, in fair condition.

NORTH BRANCH OF TALBOT ROAD—Station No. 8—Lot 46, N.T.R.N., Southwold Township.

Friday, August 14, to Thursday, August 20, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fine	Sat. Fine	Sun. Cloudy	Mon. Fine	Tues. Cloudy	Wed. Fair	Thur. Rain	Total	Daily Average
One horse light vehicle	14	33	22	6	12	18	26	131	18.7
One horse heavy vehicle	2	.....	.....	1	2	1	1	7	1.0
Two horse light vehicle	1	6	.....	2	6	3	4	22	3.2
Two horse heavy vehicle	8	7	.....	15	5	3	2	40	5.7
Runabout	7	2	14	6	2	4	2	37	5.3
Touring Car	23	33	62	32	14	29	11	204	29.1
Motor Truck	2	2	.....	.....	3	2	2	11	1.6
Total	57	83	98	62	44	60	48	452	64.6

Condition of Road:—Gravel road, in fair condition.

Stratford.

Census was taken from Wednesday, August 5, to Tuesday, August 11, inclusive. The following roads were taken into considertaion:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Shakespeare Road	2	1½ and 3½ miles.
2	St. Mary's Road	2	½ and 4 miles.
3	Embro Road	1	½ mile.
4	Huron Road	2	1½ and 3½ miles.
5	North Gravel Road	2	2 and 3½ miles.
		9 (represented by 8 stations on map).	

Within a reasonable distance from the city there are a few places of importance, viz.: St. Mary's, St. Paul, New Hamburg and Shakespeare. These cause a large amount of local traffic on roads.

There is a large amount of through traffic on Huron and Shakespeare Roads.

The roads adjacent to the city are built of gravel and are in fair condition.

SHAKESPEARE ROAD—Station No. 1.—Lot 36 Concession I, North Easthope Township.

Wednesday, August 5, to Tuesday, August 11, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	30	54	44	38	25	24	30	245	35.0
One horse heavy vehicle	.....	.....	9	16	.....	4	6	35	5.0
Two horse light vehicle	.....	.....	2	.....	.....	1	1	4	0.6
Two horse heavy vehicle	24	4	13	20	.....	25	30	116	16.5
Runabout	8	9	4	9	7	11	5	53	7.6
Touring Car	23	39	36	28	43	19	17	205	29.2
Motor Truck	.....	.....	.....	.....	.....	.....	2	2	0.3
Total	85	106	108	111	75	84	91	660	94.2

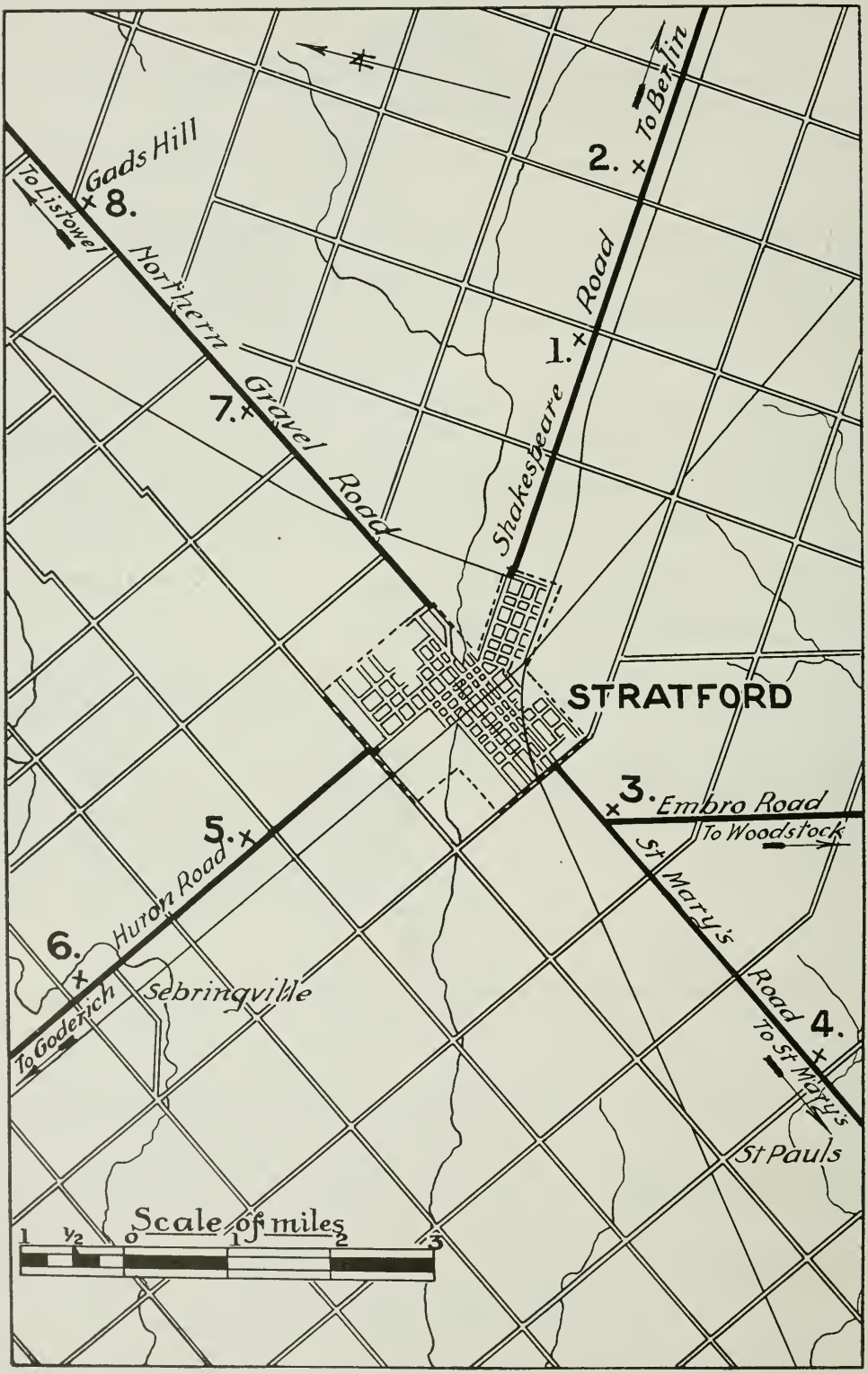
Condition of Road:—Gravel road, in fair condition.

SHAKESPEARE ROAD—Station No. 2—Lot 30, Concession I, South Easthope Township.

Wednesday, August 5, to Tuesday, August 11, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Fair	Fri. Fine	Sat. Fine	Sun. Fair	Mon. Cloudy	Tues. Fair	Total	Daily Average
One horse light vehicle	31	58	38	50	32	26	31	266	38.0
One horse heavy vehicle	3	4	6	19	.....	3	7	42	6.0
Two horse light vehicle	.....	.....	.....	.....	2	2	2	6	0.9
Two horse heavy vehicle	10	9	14	6	.....	9	9	57	8.1
Runabout	7	11	4	8	8	13	4	55	7.8
Touring Car	25	33	37	25	42	17	15	194	27.8
Motor Truck	.....	.....	.....	1	.....	.....	2	3	0.4
Total	76	115	99	109	84	70	70	623	89.0

Condition of Road:—Gravel road, in fair condition.


To Berlin
2.
Shakespeare Road
1.
Gads Hill
8.
To Listowel
Northern Gravel Road
7.
STRATFORD
3.
Embro Road
To Woodstock
St Mary's Road
4.
To St Mary's
St Pauls
5.
Huron Road
6.
Sebringville
To Goderich
Scale of miles
1 ½ 0 1 2 3

ST. MARY'S ROAD—Station No. 3—Junction of Embro Road.

Including traffic from Embro Road.

Wednesday, August 5, to Tuesday, August 11, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle.....	139	235	129	145	117	84	104	953	136.1
One horse heavy vehicle.....	40	34	26	67	14	37	44	262	37.4
Two horse light vehicle.....	3	3	4	7	10	1	8	36	5.2
Two horse heavy vehicle.....	55	10	63	59	.....	80	71	338	48.3
Runabout	32	39	19	26	67	4	16	203	29.0
Touring Car.....	52	70	49	39	66	20	49	345	49.3
Motor Truck.....	.....	2	.....	.....	1	2	1	6	0.8
Total	321	393	290	343	275	228	293	2,143	306.1

Condition of Road:—Gravel road, in good condition.

ST. MARY'S ROAD—Station No. 3—Junction of Embro Road.

Excluding traffic from Embro Road.

Wednesday, August 5, to Tuesday, August 11, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle.....	89	167	85	94	92	58	62	647	92.4
One horse heavy vehicle.....	23	25	17	44	12	25	31	177	25.3
Two horse light vehicle.....	2	3	1	3	9	1	7	26	3.7
Two horse heavy vehicle.....	21	7	30	12	.....	36	31	137	19.6
Runabout	25	24	15	18	36	1	9	128	18.3
Touring Car.....	36	51	40	27	47	12	37	250	34.7
Motor Truck.....	.....	1	.....	.....	1	2	1	5	0.7
Total	196	278	188	198	197	135	178	1,370	195.7

Condition of Road:—Gravel road, in good condition.

ST. MARY'S ROAD—Station No. 4—Lot A, Con. IX, Gore of Downie Township.

Wednesday, August 5, to Tuesday, August 11, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Fair	Fri. Fine	Sat. Fine	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle.....	42	96	45	44	43	37	33	340	48.5
One horse heavy vehicle.....	15	3	.....	20	2	4	4	48	6.9
Two horse light vehicle.....	.....	4	.....	1	3	1	6	15	2.1
Two horse heavy vehicle.....	18	5	20	7	.....	13	9	72	10.2
Runabout	8	5	7	.....	2	3	1	26	3.8
Touring Car.....	32	48	31	14	34	7	20	186	26.6
Motor Truck.....	.....	2	.....	.....	2	2	1	7	1.0
Total	115	163	103	86	86	67	74	694	99.1

Condition of Road:—Gravel road, in good condition.

EMBRO ROAD—Station No. 3—Junction of St. Mary's Road.

Wednesday, August 5, to Tuesday, August 11, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	50	68	44	51	25	26	42	306	43.7
One horse heavy vehicle	17	9	9	23	2	12	13	85	12.1
Two horse light vehicle	1	.....	3	4	1	.....	1	10	1.5
Two horse heavy vehicle	34	3	33	47	.....	44	40	201	28.7
Runabout	7	15	4	8	31	3	7	75	10.7
Touring Car	16	19	9	12	19	8	12	95	13.6
Motor Truck	.....	1	.....	.....	.....	.....	.....	1	0.1
Total	125	115	102	145	78	93	115	773	110.4

Condition of Road:—Gravel road, in fair condition.

HURON ROAD—Station 5—Lot 13, Concession I, Downie Township.

Wednesday, August 5, to Tuesday, August 11, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Shwry	Mon. Shwry	Tues. Fair	Total	Daily Average
One horse light vehicle	94	177	84	108	55	64	84	666	95.1
One horse heavy vehicle	12	7	17	29	.....	19	20	104	14.9
Two horse light vehicle	3	5	10	8	.....	4	5	35	5.0
Two horse heavy vehicle	17	9	18	30	.....	17	8	99	14.1
Runabout	11	15	8	5	15	.....	4	58	8.2
Touring Car	66	105	60	36	53	23	44	387	55.3
Motor Truck	.....	.....	.....	2	.....	.....	2	4	0.6
Total	203	318	197	218	123	127	167	1,353	193.2

Condition of Road:—Gravel road, in fair condition.

HURON ROAD—Station No. 6—Lot 20, Concession I, Ellice Township.

Wednesday, August 5, to Tuesday, August 11, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Fair	Fri. Warm	Sat. Fair	Sun. Fair	Mon. Rain	Tues. Fair	Total	Daily Average
One horse light vehicle	73	98	78	95	72	60	80	556	79.5
One horse heavy vehicle	2	8	6	17	.....	13	7	53	7.5
Two horse light vehicle	7	5	5	8	.....	5	5	35	5.0
Two horse heavy vehicle	16	32	28	39	.....	17	15	147	21.0
Runabout	4	5	9	4	6	4	5	37	5.2
Touring Car	49	61	41	18	40	18	24	251	35.9
Motor Truck	1	1	1	.....	.....	.....	1	4	0.6
Total	152	210	168	181	118	117	137	1,083	154.7

Condition of Road:—Gravel road, in fair condition.

NORTH GRAVEL ROAD—Station No. 7—Lot 1, Concession 1, Ellice Township.

Wednesday, August 5, to Tuesday, August 11, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Cloudy	Tues. Cloudy	Total	Daily Average
One horse light vehicle	48	87	51	93	27	43	38	387	55.2
One horse heavy vehicle	6	4	8	11	.....	5	7	41	5.9
Two horse light vehicle	4	1	1	8	.....	2	5	21	3.0
Two horse heavy vehicle	9	4	9	10	.....	19	15	66	9.5
Runabout	6	8	3	3	7	2	4	33	4.7
Touring Car	13	7	19	6	8	4	9	66	9.4
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	86	111	91	131	42	75	78	614	87.7

Condition of Road:—Gravel road, in fair condition.

NORTH GRAVEL ROAD—Station No. 8—Gad's Hill.

Wednesday, August 5, to Tuesday, August 11, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Fine	Fri. Cloudy	Sat. Fair	Sun. Fair	Mon. Rain	Tues. Fair	Total	Daily Average
One horse light vehicle	41	73	33	67	19	30	38	301	43.0
One horse heavy vehicle	10	4	7	8	.....	3	6	38	5.4
Two horse light vehicle	3	3	.....	4	3	2	9	24	3.5
Two horse heavy vehicle	8	3	4	8	.....	14	6	43	6.1
Runabout	1	.....	2	2	5	3	1	14	2.0
Touring Car	11	6	10	8	7	3	9	54	7.7
Motor Truck	.....	.....	1	.....	.....	.....	.....	1	0.1
Total	74	89	57	97	34	55	69	475	67.8

Condition of Road:—Gravel road, in fair condition.

Owen Sound.

Census was taken from Wednesday Aug. 19, to Tuesday, Aug. 25, inclusive. The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	St. Vincent Road	2	1½ and 7 miles.
2	North Gravel Road	2	1½ and 5½ miles.
3	Garafraxa Road	2	1½ and 4½ miles.
4	Tara Road	2	1½ and 5 miles.
5	Shore Road	1	1 mile.
		9	

There are several places of importance within reasonable distance from the city, viz.: Flesherton, Markdale, Priceville and Meaford.

The Shore Road is the heaviest travelled road, with two-horse heavy vehicle traffic from cement mills located about 1½ miles from city limits, as well as light horse and motor traffic to and from hotel situated on lake about three miles from city. This is a stone road and for two miles is in good condition. The remaining roads are built of gravel and are in fair condition, but in parts are very bad.

St Vincent
Road 2.
To Collingwood
OWEN SOUND
1.
6.
Gara Fraxa Road
Ashley
To Mount Forest
5.
Shore Road
9.
Centre Diagonal Road
7.
8. Road
3.
North Gravel Road
4.
Jackson
Tara
Kilsyth
Scale of miles.
0
1
2
3

ST. VINCENT ROAD—Station No. 1—Lot 18, Concession X, Sydenham Township.

Wednesday, August 19, to Tuesday, August 25, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Cloudy	Thur. Rain	Fri. Fair	Sat. Fair	Sun. Cloudy	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	90	66	77	122	79	58	55	547	78.1
One horse heavy vehicle	7	12	13	9	2	8	10	61	8.7
Two horse light vehicle	11	11	23	32	5	1	10	93	13.3
Two horse heavy vehicle	42	15	46	58	.....	11	19	191	27.2
Runabout	6	.....	7	5	11	4	5	38	5.4
Touring Car	9	6	5	12	12	9	7	60	8.6
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	165	110	171	238	109	91	106	990	141.3

Condition of Road:—Stone road, with gravel foundation, in very poor condition.

ST. VINCENT ROAD—Station 2—Lot 22, Concession I, Sydenham Township.

Wednesday, August 19, to Tuesday, August 25, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Rain	Tues. Cloudy	Total	Daily Average
One horse light vehicle	18	22	21	34	24	16	28	163	23.3
One horse heavy vehicle	.....	3	2	2	1	.....	5	13	1.9
Two horse light vehicle	7	4	3	17	12	10	5	58	8.3
Two horse heavy vehicle	4	7	.....	6	9	4	8	38	5.4
Runabout	6	8	5	5	4	.....	3	31	4.4
Touring Car	2	7	2	9	2	4	11	37	5.3
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	37	51	33	73	52	34	60	340	48.6

Condition of Road:—Stone road with gravel foundation, in poor condition; loose stones in parts.

NORTH GRAVEL ROAD—Station No. 3—Lot 17, Concession IV, Derby Township.

Thursday, August 20, to Wednesday, August 26, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fine	Sat. Cloudy	Sun. Fair	Mon. Fair	Tues. Clear	Wed. Cloudy	Total	Daily Average
One horse light vehicle	58	71	114	50	58	58	75	484	69.1
One horse heavy vehicle	15	13	13	.....	14	12	16	83	11.9
Two horse light vehicle	1	8	5	3	5	4	6	32	4.6
Two horse heavy vehicle	8	20	15	.....	8	25	8	84	12.0
Runabout	.....	5	4	2	.....	6	3	20	2.9
Touring Car	2	16	15	24	16	23	19	115	16.4
Motor Truck	.....	.....	1	.....	.....	.....	.....	1	0.1
Total	84	133	167	79	101	128	127	819	117.0

Condition of Road:—Gravel road, in fair condition

NORTH GRAVEL ROAD—Station No. 4—Jackson.

Thursday, August 20, to Wednesday, August 26, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Wed. Fair	Total	Daily Average
One horse light vehicle	32	36	56	35	26	26	39	250	35.7
One horse heavy vehicle	1	.....	2	.....	1	4	1	9	1.3
Two horse light vehicle	1	4	5	2	.....	1	4	17	2.4
Two horse heavy vehicle	.....	14	3	.....	12	8	10	47	6.7
Runabout	.....	4	2	1	2	1	2	12	1.7
Touring Car	.....	5	5	14	7	12	8	51	7.3
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	34	63	73	52	48	52	64	386	55.1

Condition of Road:—Gravel road, in fair condition.

GARAFRAXA ROAD—Station No. 6—Lot 13, Concession XII, Sydenham Township.

Wednesday, August 19, to Tuesday, August 25, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Cloudy	Thur. Cloudy	Fri. Fine	Sat. Cloudy	Sun. Cloudy	Mon. Fine	Tues. Fine	Total	Daily Average
One horse light vehicle	75	56	77	119	80	71	58	536	76.6
One horse heavy vehicle	15	5	10	8	1	2	9	50	7.1
Two horse light vehicle	10	.....	12	8	6	4	9	49	7.0
Two horse heavy vehicle	16	19	12	25	.....	6	13	91	13.0
Runabout	2	1	3	4	1	4	2	17	2.4
Touring Car	5	4	12	17	20	14	11	83	11.9
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	123	85	126	181	108	101	102	826	118.0

Condition of Road:—Stone road, solid, but rough.

GARAFRAXA ROAD—Station No. 5—Lot 4, Concession XII, Sydenham Township.

Wednesday, August 19, to Tuesday, August 25, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Cloudy	Thur. Rain	Fri. Fair	Sat. Fair	Sun. Cloudy	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	38	26	42	43	46	32	32	259	37.0
One horse heavy vehicle	4	.....	3	5	.....	.....	2	14	2.0
Two horse light vehicle	7	1	7	7	7	4	10	43	6.1
Two horse heavy vehicle	9	9	7	4	.....	3	10	42	6.0
Runabout	2	1	3	2	2	2	.....	12	1.7
Touring Car	8	1	11	15	19	15	12	81	11.6
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	68	38	73	76	74	56	66	451	64.4

Condition of Road:—Stone road, solid, but rough.

TARA ROAD—Station No. 7—Lot 13, Concession II, Derby Township.

Wednesday, August 19, to Tuesday, August 25, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Cloudy	Thur. Rain	Fri. Fair	Sat. Fair	Sun. Cloudy	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	139	75	136	172	93	93	98	806	115.1
One horse heavy vehicle	8	3	8	9	.....	13	6	47	6.7
Two horse light vehicle	6	3	10	15	3	7	10	54	7.7
Two horse heavy vehicle	31	38	54	40	.....	36	41	248	35.4
Runabout	1	1	2	7	2	3	4	20	2.9
Touring Car	10	11	11	24	25	33	12	126	18.0
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	195	131	221	275	123	185	171	1,301	185.8

Condition of Road:—Gravel road, in fair condition.

TARA ROAD—Station No. 8—East of Squire (Lot 10, Con. V, Derby Township).

Wednesday, August 19, to Tuesday, August 25, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	58	27	95	78	58	26	41	383	54.7
One horse heavy vehicle	6	2	5	2	.....	5	6	26	3.7
Two horse light vehicle	1	3	8	3	2	3	4	24	3.4
Two horse heavy vehicle	7	5	9	10	.....	9	24	64	9.1
Runabout	3	1	3	3	2	3	3	18	2.6
Touring Car	1	3	10	17	12	11	6	60	8.6
Motor Truck	.....	...	..	.....	.....	.....	.....	.....	.....	.....
Total	76	41	130	113	74	57	84	575	82.1

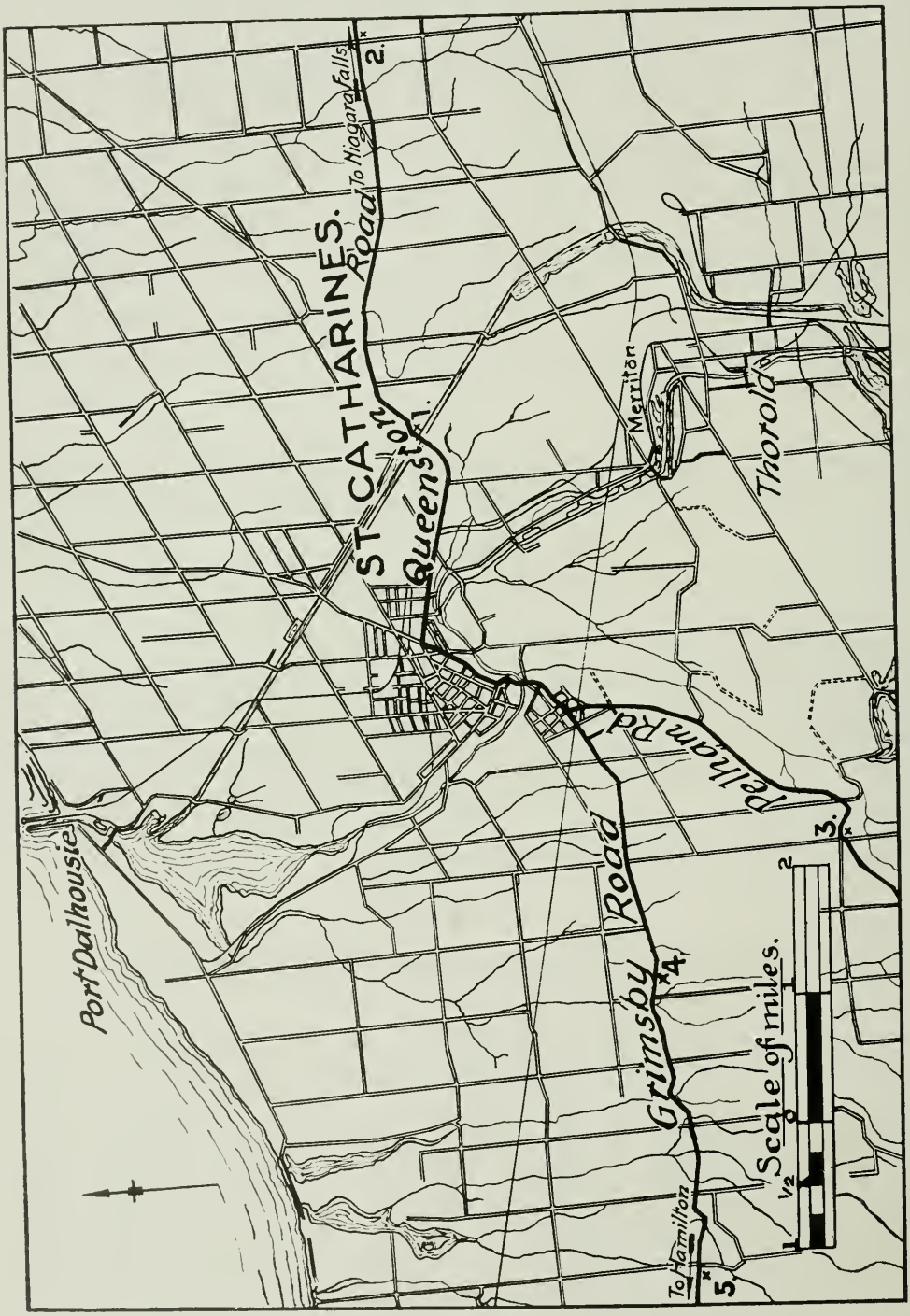
Condition of Road:—Gravel road, in fair condition.

SHORE ROAD—Station No. 9—Junction of Centre Diagonal Road.

Wednesday, August 19, to Tuesday, August 25, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Rain	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	181	122	145	206	117	129	106	1,006	143.7
One horse heavy vehicle	55	48	82	57	8	55	68	373	53.3
Two horse light vehicle	35	11	14	28	2	10	11	111	15.9
Two horse heavy vehicle	86	53	64	78	.....	86	67	434	62.0
Runabout	5	10	12	17	30	26	24	124	17.7
Touring Car	49	31	26	27	76	44	32	285	40.7
Motor Truck	.....	.....	1	.....	.....	.....	.....	1	0.2
Total	411	275	344	413	233	350	308	2,334	333.5

Condition of Road:—Stone road, in good condition for about 2 miles.


ST CATHARINES.
Road To Niagara Falls
2.
Queen St
1.
Merriton
Thorold
Pelham Rd
3.
Port Dalhousie
Grimsby Road
4
To Hamilton
5
Scale of miles.
½
1
2

St. Catharines.

Census was taken from Friday, August 7, to Thursday, August 13, inclusive. The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Queenston Stone Road	2	1½ and 5 miles.
2	Pelham Road	1	3 miles.
3	Grimsby Stone Road	2	2 and 4½ miles.
		5	

The new Welland Ship Canal which is under construction has caused the extra heavy vehicular traffic on the first two miles of Queenston Stone Road.

There is a heavy through motor traffic between Niagara Falls and Hamilton on Queenston and Grimsby Stone Roads. These two roads are in good condition and the surface is treated with oil for almost the entire length of the County Road System (30 miles).

There is an excessive motor pleasure traffic (city) on said roads after 7 p.m.

At the point where Queenston Stone Road crosses the new canal, the road has been diverted; this part is in rather a bad condition, which causes many motorists to come thus far and return eastward.

QUEENSTON STONE ROAD—Station No. 1—Canal Bridge No. 7.

Friday, August 7, to Thursday, August 13, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Cloudy	Wed. Fair	Thur. Cloudy	Total	Daily Average
One horse light vehicle	100	164	81	103	122	104	103	777	111.0
One horse heavy vehicle	31	18	1	29	30	15	27	151	21.6
Two horse light vehicle	82	96	2	90	82	83	50	485	69.3
Two horse heavy vehicle	107	91	2	106	100	98	48	552	78.9
Runabout	22	31	38	10	16	9	8	134	19.1
Touring Car	155	210	318	176	149	204	155	1,367	195.3
Motor Truck	7	8	.....	2	7	8	5	37	5.3
Total	504	618	442	516	506	521	396	3,503	500.5

Condition of Road:—Stone road, with surface oiled in parts, in fair condition.
Remarks:—Extra heavy traffic to and from new canal which is being constructed.

QUEENSTON STONE ROAD—Station No. 2—Lot 143, Niagara Township.

Friday, August 7, to Thursday, August 13, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Cloudy	Sat. Fair	Sun. Fair	Mon. Rain	Tues. Cloudy	Wed. Fine	Thur. Rain	Total	Daily Average
One horse light vehicle	13	10	19	15	20	13	15	105	15.0
One horse heavy vehicle	4	5	5	2	11	2	12	41	5.9
Two horse light vehicle	2	.....	1	5	3	1	2	14	2.0
Two horse heavy vehicle	15	3	6	2	10	19	12	67	9.6
Runabout	8	34	50	18	15	15	6	146	20.8
Touring Car	85	131	239	92	81	135	102	865	123.6
Motor Truck	4	2	.....	.....	.....	5	4	15	2.1
Total	131	185	320	134	140	190	153	1,253	179.0

Condition of Road:—Stone road, in good condition. Part of this road, however, is diverted at crossing of new canal, and is badly cut up.

PELHAM ROAD—Station No. 3—West of Power Glen (Town Line of Louth and Grantham).

Friday, August 7, to Thursday, August 13, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Fine	Sun. Fine	Mon. Rain	Tues. Cloudy	Wed. Fair	Thur. Rain	Total	Daily Average
One horse light vehicle	20	69	34	40	31	18	31	243	34.7
One horse heavy vehicle	14				6	1	3	24	3.4
Two horse light vehicle	4	16		7	10	5	4	46	6.6
Two horse heavy vehicle	3	10		5	2	5	18	43	6.1
Runabout	3		1		1	1		6	0.9
Touring Car	2	4	2	4	5	10	10	37	5.3
Motor Truck									
Total	46	99	37	56	55	40	66	399	57.0

Condition of Road:—Stone road, in very bad condition, with loose stones and ruts.

GRIMSBY STONE ROAD—Station No. 4—Lot 4, Concession V, Louth Township.

Friday, August 7, to Thursday, August 13, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Fair	Sun. Fine	Mon. Fair	Tues. Fine	Wed. Fair	Thur. Fine	Total	Daily Average
One horse light vehicle	36	159	51	38	54	28	66	422	60.3
One horse heavy vehicle	8	27	9	18	14	15	18	109	15.6
Two horse light vehicle	8	55	1	4	12	3	7	100	14.3
Two horse heavy vehicle	26	31	2	22	49	63	35	228	32.6
Runabout	11	34	56	30	19	23	19	192	27.4
Touring Car	79	165	223	102	83	118	119	889	127.0
Motor Truck	2					1	1	4	0.6
Total	170	471	342	214	231	251	265	1,944	277.8

Condition of Road:—Stone road, with surface treated with oil, in good condition.

GRIMSBY STONE ROAD—Station No. 5—Lot 12, Concession V, Louth Township.

Friday, August 7, to Thursday, August 13, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Fair	Sun. Cloudy	Mon. Fine	Tues. Fair	Wed. Fair	Thur. Cloudy	Total	Daily Average
One horse light vehicle	32	144	45	39	46	42	60	408	58.3
One horse heavy vehicle	4	14	2	11	4	7	9	51	7.3
Two horse light vehicle	4	40	1	4	4	6	5	64	9.1
Two horse heavy vehicle	27	29	2	17	19	27	18	139	19.9
Runabout	9	19	16	19	13	15	13	104	14.8
Touring Car	76	135	214	101	89	118	117	850	121.4
Motor Truck	1					1	1	3	0.5
Total	153	381	280	191	175	216	223	1,619	231.3

Condition of Road:—Stone road, with surface treated with oil, in good condition.

Chatham.

Census was taken from Monday, August 10, to Sunday, August 16, inclusive. The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Longwoods Road	2	1½ and 4 miles.
2	Town Line Road (south)	2	1 and 3½ miles.
3	Tecumseh Road	1	1½ miles.
4	River Road	2	1½ and 4½ miles.
5	Town Line Road (north)	2	1½ and 5 miles.
		9	

The heaviest travelled road is Town Line Road (south), the motor traffic going to and from Cedar Springs, connecting with Talbot Road, and Lake Erie. This road is partly sand and gravel and in poor condition.

The other roads adjacent to the city are of clay or sand and are in bad condition and unsuitable for heavy horse and motor traffic. Should these roads be improved, the traffic on some would increase more than 100 per cent.

LONGWOODS ROAD—Station No. 1—Lot 6, R. R. Chatham Township.

Monday, August 10, to Sunday, August 16, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Fair	Tues. Fair	Wed. Fine	Thur. Fair	Fri. Fine	Sat. Fine	Sun. Fine	Total	Daily Average
One horse light vehicle	22	33	38	31	25	63	45	257	36.7
One horse heavy vehicle	5	.....	1	2	.....	7	.....	15	2.1
Two horse light vehicle	.....	3	5	1	3	6	1	19	2.8
Two horse heavy vehicle	13	11	13	11	18	18	.....	84	12.0
Runabout	4	2	5	5	2	.....	9	27	3.9
Touring Car	4	6	21	11	3	14	22	81	11.6
Motor Truck	.....	.....	.....	1	.....	.....	.....	1	0.1
Total	48	55	83	62	51	108	77	484	69.2

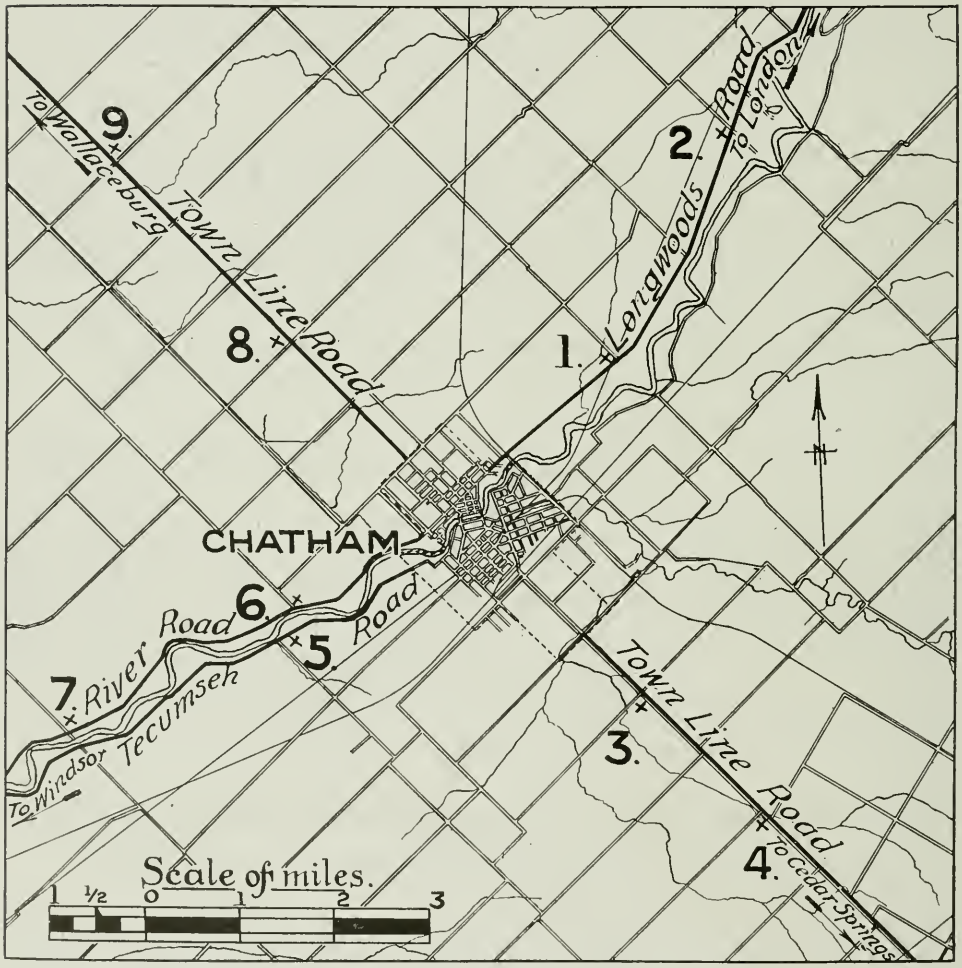
Condition of Road:—Clay road, in poor condition.

LONGWOODS ROAD—Station No. 2—West of Louisville (at Lot 12, R.R. Chatham Township).

Monday, August 10, to Sunday, August 16, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Mon. Shwry	Tues. Cloudy	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Cloudy	Total	Daily Average
One horse light vehicle	18	31	27	25	24	60	43	228	32.6
One horse heavy vehicle	2	.....	.....	1	.....	3	.....	6	0.9
Two horse light vehicle	.....	2	3	1	3	6	1	16	2.3
Two horse heavy vehicle	6	7	4	4	14	12	.....	47	6.7
Runabout	4	2	4	5	2	.....	5	22	3.1
Touring Car	2	5	18	8	3	15	21	72	10.3
Motor Truck	.....	.....	.....	1	.....	.....	.....	1	0.1
Total	32	47	56	45	46	96	70	392	56.0

Condition of Road:—Clay road, in poor condition.


To Wallaceburg
9.
Town Line Road
8.
1.
Longwoods Road
2.
To London
CHATHAM
6.
River Road
5.
Road
7.
Tecumseh
To Windsor
Town Line Road
3.
4.
To Cedar Springs
Scale of miles.
1 ½ 0 1 2 3

TOWN LINE ROAD (north)—Station No. 3—Lot 1, Concession IV, T.L. Harwich Township

Saturday, August 8, to Friday, August 14, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fine	Sun. Fair	Mon. Shwry	Tues. Fair	Wed. Fair	Thur. Fair	Fri. Fair	Total	Daily Average
One horse light vehicle	197	93	55	75	79	63	95	657	93.8
One horse heavy vehicle	16	.....	.....	6	14	4	8	48	6.9
Two horse light vehicle	21	.....	6	8	13	11	8	67	9.6
Two horse heavy vehicle	47	.....	22	37	29	23	27	185	26.4
Runabout	4	15	9	6	17	11	4	66	9.4
Touring Car	92	104	73	42	76	82	68	537	76.7
Motor Truck	.....	.....	1	.....	.....	.....	4	5	0.7
Total	377	212	166	174	228	194	214	1,565	223.5

Condition of Road:—Partly sand and gravel road, in poor condition.

TOWN LINE ROAD (south)—Station No. 4—Lot 27, Concession III, W.C..R. Harwich Township.

Saturday, August 8, to Friday, August 14, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fine	Sun. Fine	Mon. Cloudy	Tues. Fine	Wed. Fine	Thur. Fair	Fri. Fair	Total	Daily Average
One horse light vehicle	151	39	23	19	42	26	47	347	49.6
One horse heavy vehicle	10	.....	1	5	9	.....	1	26	3.8
Two horse light vehicle	20	.....	5	3	13	3	6	50	7.1
Two horse heavy vehicle	20	.....	20	22	25	12	8	107	15.2
Runabout	4	9	7	4	16	7	2	49	7.0
Touring Car	84	87	68	38	76	68	63	484	69.2
Motor Truck	.....	.....	.....	.....	.....	2	2	4	0.5
Total	289	135	124	91	181	118	129	1,067	152.4

Condition of Road:—Partly sand and gravel road, in poor condition.

TECUMSEH ROAD—Station No. 5—Lot 18 R.R. Raleigh Township.

Saturday, August 8, to Friday, August 14, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fine	Sun. Fine	Mon. Rain	Tues. Rain	Wed. Fair	Thur. Fine	Fri. Fine	Total	Daily Average
One horse light vehicle	72	52	43	47	46	76	62	398	56.8
One horse heavy vehicle	19	2	6	4	12	25	27	95	13.6
Two horse light vehicle	14	2	8	6	8	26	27	91	13.0
Two horse heavy vehicle	90	.....	18	10	27	41	41	227	32.5
Runabout	2	6	3	.....	3	17	5	36	5.1
Touring Car	24	88	15	8	21	71	40	267	38.1
Motor Truck	.....	.....	1	.....	1	2	1	5	0.7
Total	221	150	94	75	118	258	203	1,119	159.8

Condition of Road:—Clay road, in poor condition.

RIVER ROAD—Station No. 6—Lot 20, Concession I, Dover Township.

Saturday, August 8, to Friday, August 14, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fine	Sun. Fine	Mon. Shwry	Tues. Fine	Wed. Fine	Thur. Shwry	Fri. Fine	Total	Daily Average
One horse light vehicle	155	22	37	50	64	44	64	436	62.2
One horse heavy vehicle	.....	.....	1	2	1	3	2	9	1.3
Two horse light vehicle	26	2	6	14	6	8	4	66	9.5
Two horse heavy vehicle	18	.....	11	32	48	28	14	151	21.6
Runabout	3	2	.....	.....	1	.....	.....	6	0.9
Touring Car	21	24	8	2	12	12	3	82	11.7
Motor Truck	.....	.....	.....	.....	2	.....	.....	2	0.2
Total	223	50	63	100	134	95	87	752	107.4

Condition of Road:—Clay road, in poor condition.

RIVER ROAD—Station No. 7—Lot 213, Concession I, Dover Township.

Saturday, August 8, to Friday, August 14, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fair	Sun. Fair	Mon. Cloudy	Tues. Fair	Wed. Fair	Thur. Rain	Fri. Fair	Total	Daily Average
One horse light vehicle	75	28	27	30	29	29	37	255	36.5
One horse heavy vehicle	1	.....	3	3	5	1	6	19	2.7
Two horse light vehicle	15	.....	5	11	4	4	1	40	5.7
Two horse heavy vehicle	9	.....	5	14	9	17	9	63	9.0
Runabout	2	1	.....	.....	.....	1	1	5	0.7
Touring Car	9	16	1	.....	5	3	.....	34	4.8
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	111	45	41	58	52	55	54	416	59.4

Condition of Road:—Clay road, in poor condition.

TOWN LINE ROAD (North)—Station No. 8—Lot 24, Concession IV, Chatham Township.

Saturday, August 8, to Friday, August 14, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fair	Sun. Cloudy	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Rain	Fri. Fair	Total	Daily Average
One horse light vehicle	98	65	55	40	70	45	52	425	60.7
One horse heavy vehicle	3	.....	5	1	1	1	3	14	2.0
Two horse light vehicle	10	1	17	9	11	12	4	64	9.2
Two horse heavy vehicle	27	.....	36	25	38	24	11	161	23.0
Runabout	8	7	10	2	6	5	2	40	5.7
Touring Car	17	26	15	8	26	13	13	118	16.9
Motor Truck	2	.....	1	.....	.....	1	.....	4	0.5
Total	165	99	139	85	152	101	85	826	118.0

Condition of Road:—Clay road, in poor condition.

TOWN LINE ROAD (NORTH)—Station No. 9—Lot 1, Concession VI, Chatham Township.

Saturday, August 8, to Friday, August 14, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fair	Sun. Cloudy	Mon. Cloudy	Tues. Fair	Wed. Fair	Thur. Cloudy	Fri. Fair	Total	Daily Average
One horse light vehicle.....	57	40	34	33	46	39	37	286	40.8
One horse heavy vehicle.....	1	.....	2	2	1	.....	1	7	1.0
Two horse light vehicle.....	5	2	10	8	9	4	2	40	5.8
Two horse heavy vehicle.....	17	.....	26	13	17	9	5	87	12.5
Runabout	5	3	5	2	4	5	2	26	3.7
Touring Car.....	20	24	14	8	20	12	15	113	16.1
Motor Truck.....	2	.....	1	.....	.....	.....	1	4	0.5
Total	107	69	92	66	97	69	63	563	80.4

Condition of Road:—Clay road, in poor condition.

Galt.

Census was taken from Thursday, August 11, to Monday, August 17, inclusive. The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Preston Road	2	0 and 2½ miles.
2	Hespeler Road	2	0 and 3½ miles.
3	Blair Road	1	3½ miles.
4	Roseville Road	1	4½ miles.
5	Spragues Road	1	3 miles.
6	River Road	1	3½ miles.
7	Hamilton Road	1	2 miles.
		9 (represented by 8 stations on map).	

There are several important places within reasonable distance from city, viz.: Berlin, Preston, Hespeler, and Elmira. These cause a large amount of local traffic on roads.

The Preston Road, known in Berlin as the Galt Road, is a stone road with surface treated with tar, in good condition. There is a heavy pleasure motor traffic on this road after 7 p.m.

The roads adjacent to city are built of stone and are in good condition.

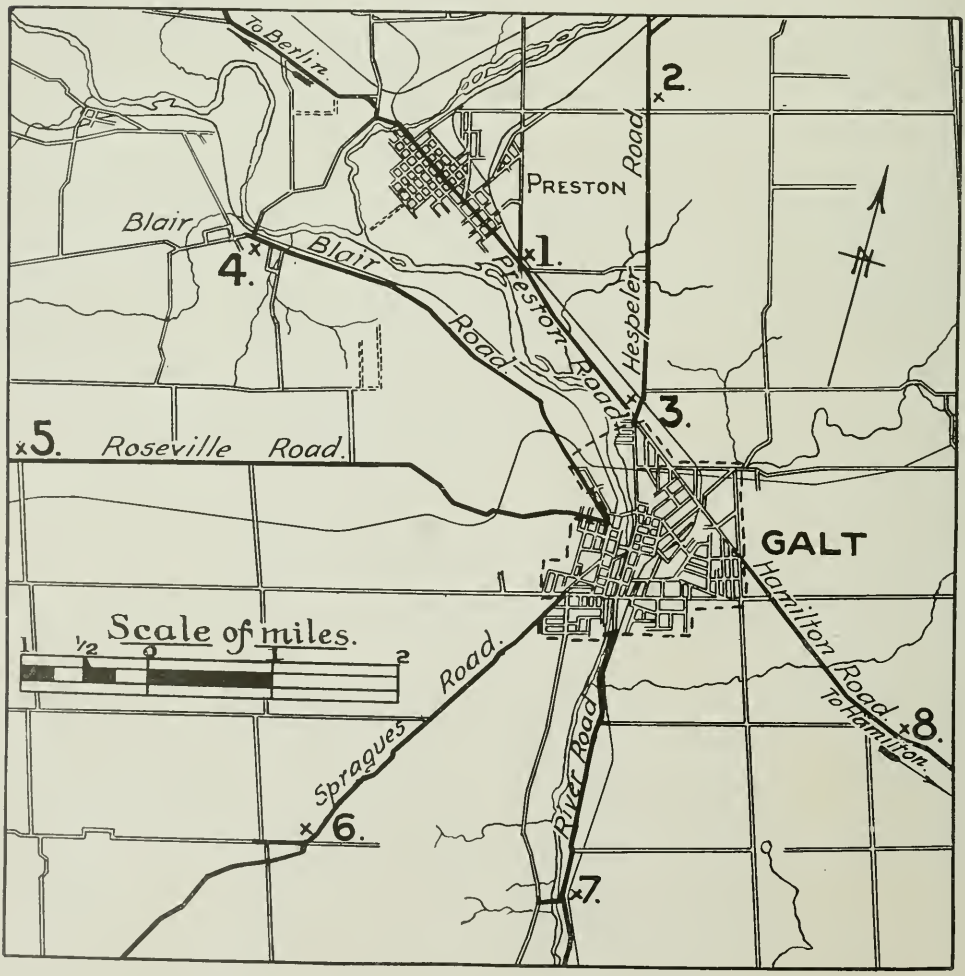
PRESTON ROAD—Station No. 3—Junction of Hespeler Road.

Including traffic from Hespeler Road.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Fine	Sun. Rain	Mon. Fine	Total	Daily Average
One horse light vehicle.....	177	145	135	146	176	68	183	1,030	147.1
One horse heavy vehicle.....	39	34	27	27	58	.....	21	206	29.4
Two horse light vehicle.....	52	5	7	7	12	1	7	91	13.0
Two horse heavy vehicle.....	78	136	131	112	77	.....	113	647	92.4
Runabout	20	21	22	25	35	27	27	177	25.3
Touring Car.....	107	82	101	113	156	134	98	791	113.0
Motor Truck.....	3	2	.....	2	.....	.....	.....	7	1.0
Total	476	425	423	432	514	230	449	2.949	421.2

Condition of Road:—Stone road, with surface treated with tar and pea gravel, in good condition.



PRESTON ROAD—Station No. 3—Junction of Hespeler Road.

Excluding traffic from Hespeler Road.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Fine	Sun. Rain	Mon. Fine	Total	Daily Average
One horse light vehicle	111	73	88	101	110	37	115	635	90.7
One horse heavy vehicle	27	19	23	24	41	.....	15	149	21.2
Two horse light vehicle	27	3	6	6	8	.....	6	56	8.0
Two horse heavy vehicle	30	56	62	39	32	.....	42	261	37.3
Runabout	16	14	19	21	31	22	22	145	20.7
Touring Car	89	52	76	99	125	112	81	634	90.6
Motor Truck	3	2	.....	1	.....	.....	.....	6	0.9
Total	303	219	274	291	347	171	281	1,886	269.4

Condition of Road:—Stone road, with surface treated with tar and pea gravel, in good condition.

PRESTON ROAD—Station No. 1—Preston Town Limits.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fair	Thur. Rain	Fri. Fair	Sat. Fair	Sun. Rain	Mon. Fair	Total	Daily Average
One horse light vehicle	40	29	28	31	80	31	27	266	38.0
One horse heavy vehicle	37	29	23	26	30	.....	24	169	24.1
Two horse light vehicle	1	4	1	8	2	.....	2	18	2.6
Two horse heavy vehicle	36	33	52	27	26	.....	20	194	27.7
Runabout	11	3	11	17	12	11	2	67	9.6
Touring Car	53	49	43	64	89	96	64	458	65.4
Motor Truck	.....	2	.....	.....	2	8	2	14	2.0
Total	178	149	158	173	241	146	141	1,186	169.4

Condition of Road:—Stone road, with surface treated with tar and pea gravel, in good condition.

HESPELER ROAD—Station No. 3—Junction of Preston Road.

Excluding traffic from Preston Road.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Fine	Thur. Rain	Fri. Fine	Sat. Fine	Sun. Rain	Mon. Fine	Total	Daily Average
One horse light vehicle	66	72	47	45	66	31	68	395	56.4
One horse heavy vehicle	12	15	4	3	17	.....	6	57	8.2
Two horse light vehicle	25	2	1	1	4	1	1	35	5.0
Two horse heavy vehicle	48	80	69	73	45	.....	71	386	55.1
Runabout	4	7	3	4	4	5	5	32	4.6
Touring Car	18	30	25	14	31	22	17	157	22.4
Motor Truck	.....	.....	.....	1	.....	.....	.....	1	0.1
Total	173	206	149	141	167	59	168	1,063	151.8

Condition of Road:—Stone road, very rough in parts.

HESPELER ROAD—Station No. 2—North of Junction of Road from Preston.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Fair	Thur. Rain	Fri. Fair	Sat. Cloudy	Sun. Rain	Mon. Fair	Total	Daily Average
One horse light vehicle	24	52	44	31	28	40	39	258	36.9
One horse heavy vehicle	8	.....	4	6	12	10	10	50	7.1
Two horse light vehicle	3	3	2	3	3	.....	5	19	2.7
Two horse heavy vehicle	11	.....	6	3	6	2	6	34	4.9
Runabout	8	4	10	8	6	6	10	52	7.4
Touring Car	22	47	43	23	35	27	30	227	32.4
Motor Truck	.....	.....	.....	.....	1	5	.....	6	0.9
Total	76	106	109	74	91	90	100	646	92.3

Condition of Road:—Stone road, very rough in parts.

BLAIR ROAD—Station No. 4—Blair (Junction of Road to Preston).

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fair	Thur. Rain	Fri. Fair	Sat. Fair	Sun. Rain	Mon. Fair	Total	Daily Average
One horse light vehicle	53	54	56	52	56	42	56	369	52.7
One horse heavy vehicle	21	30	24	17	21	2	17	132	18.9
Two horse light vehicle	4	5	10	13	12	.....	5	49	7.0
Two horse heavy vehicle	7	11	17	15	23	.....	37	110	15.7
Runabout	4	6	8	9	15	6	13	61	8.8
Touring Car	28	39	31	29	42	51	33	253	36.1
Motor Truck	8	2	7	5	3	.....	7	32	4.5
Total	125	147	153	140	172	101	168	1,006	143.7

Condition of Road:—Stone road, in good condition.

ROSEVILLE ROAD—Station No. 5—Junction of Road to Dumfries R.R. Station.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fair	Thur. Rain	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Total	Daily Average
One horse light vehicle	10	14	11	16	34	12	4	101	14.4
One horse heavy vehicle	2	1	.....	3	1	.....	.....	7	1.0
Two horse light vehicle	3	1	1	2	6	1	3	17	2.4
Two horse heavy vehicle	2	6	5	2	3	.....	.....	18	2.6
Runabout	1	1	2	.....	2	3	1	10	1.4
Touring Car	7	4	11	5	10	15	8	60	8.6
Motor Truck	1	.....	1	.....	1	.....	.....	3	0.4
Total	26	27	31	28	57	31	16	216	30.8

Condition of Road:—Stone road, in good condition.

SPRAGUES ROAD—Station No. 6—Junction of Road to Ayr.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fine	Wed. Fine	Thur. Cloudy	Fri. Fine	Sat. Fine	Sun. Rain	Mon. Fine	Total	Daily Average
One horse light vehicle.....	13	20	16	16	24	21	15	125	17.9
One horse heavy vehicle	.....	4	1	2	2	.....	.....	9	1.3
Two horse light vehicle	4	2	2	3	3	.....	7	21	3.0
Two horse heavy vehicle ...	7	.....	4	.....	2	.....	.....	13	1.9
Runabout	1	2	2	1	3	3	.....	12	1.7
Touring Car	21	15	14	19	9	29	15	122	17.4
Motor Truck	.....	1	4	.....	.....	.....	3	8	1.1
Total	46	44	43	41	43	53	40	310	44.3

Condition of Road:—Stone road, in good condition.

RIVER ROAD—Station No. 7—Bridge over Grand River.

Tuesday, August 11, to Wednesday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Rain	Mon. Fair	Total	Daily Average
One horse light vehicle.....	39	33	21	37	48	30	34	242	34.6
One horse heavy vehicle	.....	.....	.....	.....	.....	.....	.....	.....	.....
Two horse light vehicle ...	4	9	3	5	12	1	4	38	5.4
Two horse heavy vehicle ...	15	6	5	6	6	.....	8	46	6.6
Runabout	6	5	5	2	6	4	2	30	4.3
Touring Car	13	12	9	11	15	22	10	92	13.1
Motor Truck	2	3	1	2	3	.....	2	13	1.9
Total	79	68	44	63	90	57	60	461	65.9

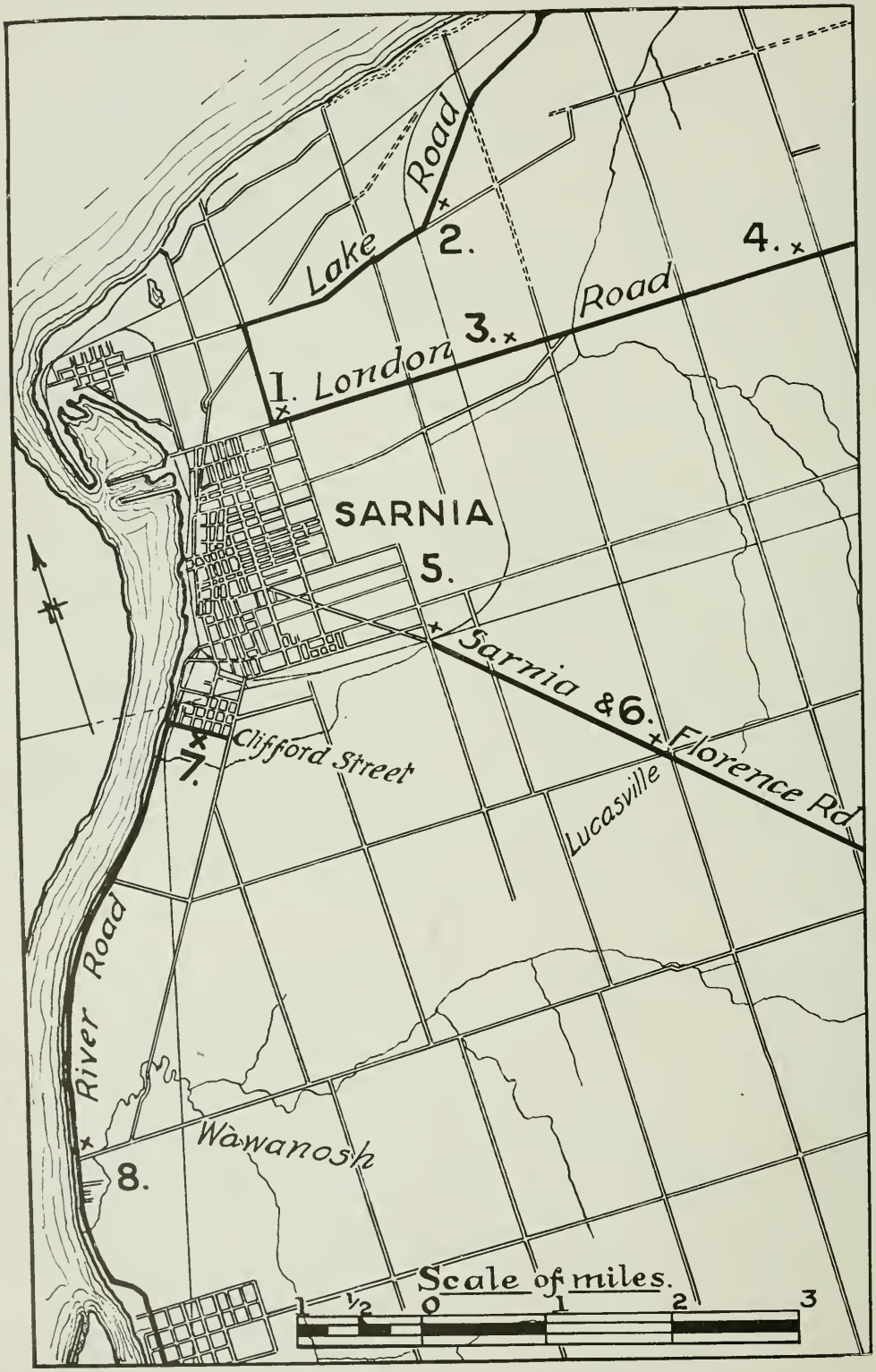
Condition of Road:—Stone road, in fair condition.

HAMILTON ROAD—Station No. 8—East of Junction of Road to Branchton.

Tuesday, August 11, to Monday, August 17, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Tues. Fair	Wed. Fair	Thur. Cloudy	Fri. Fair	Sat. Fair	Sun. Rain	Mon. Fair	Total	Daily Average
One horse light vehicle.....	77	91	66	74	102	70	79	559	79.9
One horse heavy vehicle	21	28	27	27	36	6	26	171	24.5
Two horse light vehicle	3	8	14	14	21	9	17	86	12.3
Two horse heavy vehicle ...	24	23	21	29	23	.....	20	140	20.0
Runabout	11	2	2	9	3	11	15	53	7.6
Touring Car	36	48	37	48	59	107	49	384	54.6
Motor Truck	4	6	1	3	10	.....	5	29	4.2
Total	176	206	168	204	254	203	211	1,422	203.1

Condition of Road:—Stone road, in good condition.


Lake Road
2.
4.
Road
3.
1. London
SARNIA
5.
Sarnia
&6.
Florence Rd
7.
Clifford Street
Lucasville
River Road
Wawanosh
8.
Scale of miles.
1 ½ 0 1 2 3

Sarnia.

Census was taken from Saturday, August 1, to Friday, August 7, inclusive. The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Lake Road	2	¼ and 3½ miles.
2	London Road	2	1½ and 4½ miles.
3	Sarnia and Florence Road	2	¼ and 3½ miles.
4	Clifford Street	1	0 miles.
5	River Road	2	0 and 3½ miles.
		9 (represented by 8 stations on map).	

The Sarnia and Florence Road is a toll road, built of gravel, and is in good condition.

The remaining roads are built of gravel and are in very poor shape.

LAKE ROAD—Station No. 11—North of Junction of London Road.

Saturday, August 1, to Friday, August 7, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Cloudy	Fri. Fair	Total	Daily Average
One horse light vehicle	68	83	57	61	70	57	42	438	62.5
One horse heavy vehicle	67	10	65	43	46	51	51	333	47.6
Two horse light vehicle	13	.....	15	1	3	45	5	82	11.7
Two horse heavy vehicle	49	.....	28	29	50	27	25	208	29.8
Runabout	4	4	3	2	.....	3	5	21	3.0
Touring Car	15	59	18	27	27	20	23	189	27.0
Motor Truck	8	.....	8	4	5	5	.....	30	4.2
Total	224	156	194	167	201	208	151	1,301	185.8

Condition of Road:—Gravel road, in unimproved condition.

LAKE ROAD—Station No. 2—Lot 46, L.R., Sarnia Township.

Saturday, August 1, to Friday, August 7, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fair	Sun. Cloudy	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Cloudy	Fri. Fair	Total	Daily Average
One horse light vehicle	69	33	19	37	42	24	24	248	35.5
One horse heavy vehicle	.....	.....	.....	.....	2	5	2	9	1.3
Two horse light vehicle	12	.....	2	5	3	1	4	27	3.8
Two horse heavy vehicle	19	.....	6	3	22	13	11	74	10.6
Runabout	3	3	2	.....	1	1	2	12	1.7
Touring Car	11	33	29	13	24	17	13	140	20.0
Motor Truck	2	.....	2	.....	.....	.....	.....	4	0.5
Total	116	69	60	58	94	61	56	514	73.4

Condition of Road:—Gravel road, in unimproved condition.

LONDON ROAD—Station No. 3—Lot 18, Concession VI, Sarnia Township

Friday, July 31, to Thursday, August 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fine	Sat. Fine	Sun. Fine	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Fine	Total	Daily Average
One horse light vehicle.....	49	99	39	44	53	44	34	362	51.7
One horse heavy vehicle	10	21	5	8	15	25	13	97	13.9
Two horse light vehicle	14	12	5	6	10	14	12	73	10.4
Two horse heavy vehicle ...	24	57	.....	12	32	63	51	239	34.2
Runabout	7	2	2	1	1	1	1	15	2.1
Touring Car	17	18	31	21	19	16	11	133	19.0
Motor Truck	2	.....	.....	1	2	.....	1	6	0.8
Total	123	209	82	93	132	163	123	925	132.1

Condition of Road:—Gravel road, in poor condition, sand in parts.

LONDON ROAD—Station No. 4—Lot 11, Concession VI, Sarnia Township.

Friday, July 31, to Thursday, August 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Fair	Sun. Shwry	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Fair	Total	Daily Average
One horse light vehicle.....	43	81	51	27	21	39	30	292	41.7
One horse heavy vehicle	2	7	.....	2	3	5	5	24	3.5
Two horse light vehicle	10	8	3	1	1	6	8	37	5.2
Two horse heavy vehicle ...	9	39	.....	10	15	29	28	130	18.5
Runabout	2	1	1	1	1	2	2	10	1.4
Touring Car	18	16	30	23	18	18	8	131	18.8
Motor Truck	1	.....	.....	.....	2	.....	.....	3	0.4
Total	85	152	85	64	61	99	81	627	89.5

Condition of Road:—Gravel road, in poor condition.

SARNIA AND FLORENCE ROAD—Station No. 5—First Toll Gate.

Friday, July 31, to Thursday, August 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Cloudy	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Fair	Total	Daily Average
One horse light vehicle.....	111	296	81	88	95	136	119	926	132.2
One horse heavy vehicle	13	8	11	6	17	23	12	90	12.9
Two horse light vehicle ...	5	8	.....	4	2	2	6	27	3.8
Two horse heavy vehicle ...	20	34	1	12	21	30	23	141	20.2
Runabout	4	4	4	5	4	7	.....	28	4.0
Touring Car	17	48	31	24	39	31	21	211	30.2
Motor Truck	12	7	5	2	6	6	9	47	6.7
Total	182	405	133	141	184	235	190	1,470	210.0

Condition of Road:—(Toll Road). Gravel road, in good condition.

SARNIA AND FLORENCE ROAD—Station No. 6—Lucasville.

Friday, July 31, to Thursday, August 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fair	Sat. Fair	Sun. Fine	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Fair	Total	Daily Average
One horse light vehicle.....	50	135	69	51	54	93	61	513	73.2
One horse heavy vehicle	2	4	1	1	4	10	9	31	4.4
Two horse light vehicle	4	1	.....	.....	2	.....	.....	7	1.0
Two horse heavy vehicle ...	16	22	2	11	12	13	18	94	13.5
Runabout	4	3	12	8	11	2	.....	40	5.7
Touring Car	12	18	20	17	19	13	14	113	16.2
Motor Truck	4	2	.....	1	4	4	2	17	2.4
Total	92	185	104	89	106	135	104	815	116.4

Condition of Road:—(Toll Road). Gravel road, in good condition.

CLIFFORD STREET—Station No. 7—Junction of Christina Street.

Saturday, August 1, to Friday, August 7, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fine	Sun. Fair	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Cloudy	Fri. Fine	Total	Daily Average
One horse light vehicle.....	22	9	6	25	15	16	6	99	14.1
One horse heavy vehicle	22	1	2	15	9	6	5	60	8.5
Two horse light vehicle	.....	.....	.....	.....	.....	.....	.....	.....	.....
Two horse heavy vehicle ...	10	.....	1	14	12	8	9	54	7.8
Runabout	3	.....	.....	.....	.....	.....	.....	3	0.5
Touring Car	7	1	.....	2	5	3	3	21	3.0
Motor Truck	3	.....	3	4	2	1	.....	13	1.8
Total	67	11	12	60	43	34	23	250	35.7

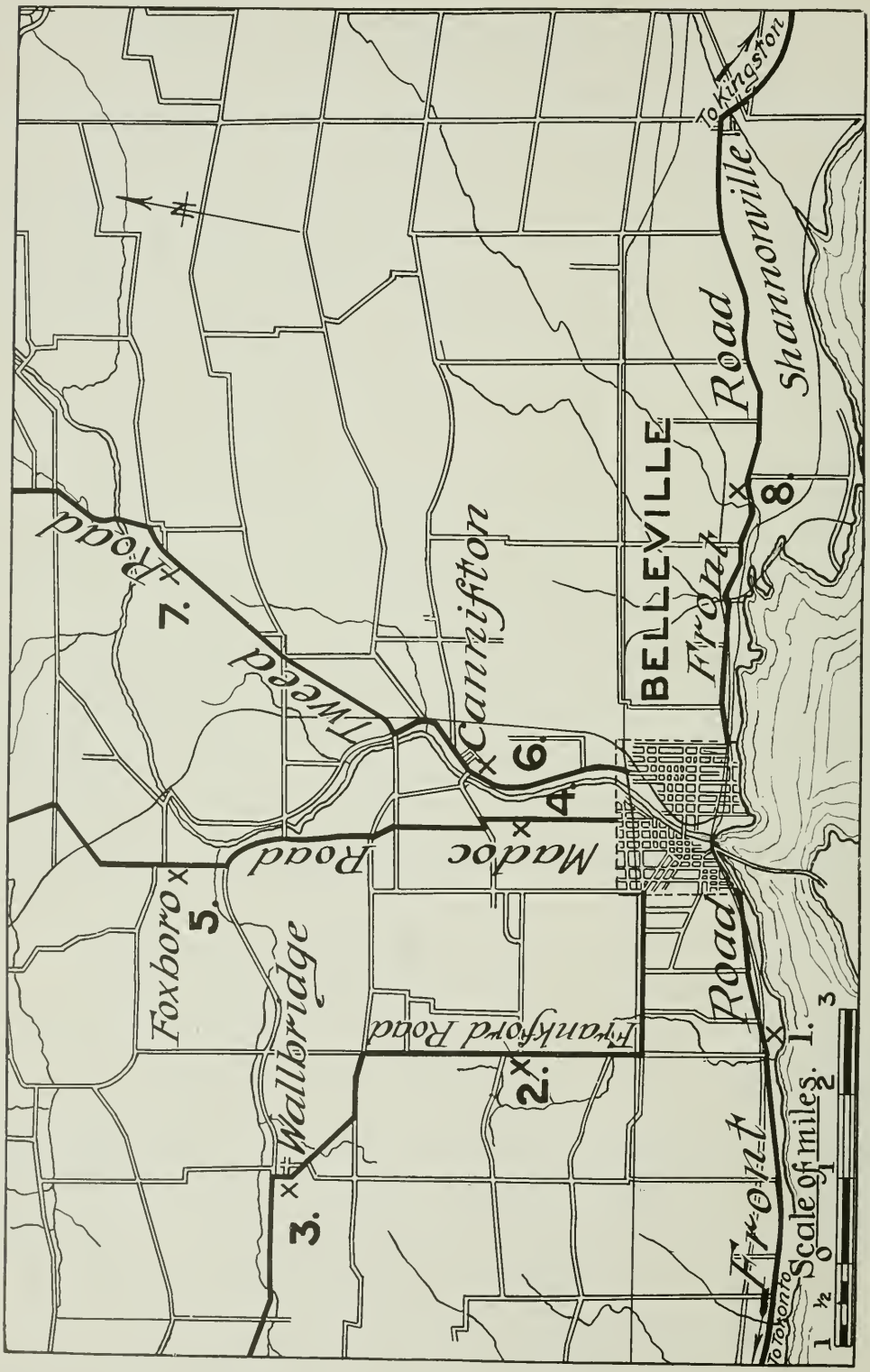
Condition of Road:—Cement concrete road, in good condition.
Remarks:—This includes traffic entering city from the south *via* the Wawanosh Road (gravel).

RIVER ROAD—Station No. 7—Junction of Clifford and Christina Streets.

Saturday, August 1, to Friday, August 7, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fine	Sun. Fair	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Cloudy	Fri. Fine	Total	Daily Average
One horse light vehicle.....	67	72	54	67	68	67	43	438	62.5
One horse heavy vehicle	20	3	17	36	37	31	23	167	23.9
Two horse light vehicle	3	2	.....	1	.....	4	2	12	1.7
Two horse heavy vehicle ...	16	2	11	39	28	27	28	151	21.6
Runabout	6	12	8	8	6	5	3	48	6.9
Touring Car	69	100	70	69	63	57	57	485	69.2
Motor Truck	2	.....	3	6	5	6	5	27	3.9
Total	183	191	163	226	207	197	161	1.328	189.7

Condition of Road:—Gravel road, in fair condition.
Remarks:—The station is actually on Clifford Street, but only the traffic from the River Road is taken into account.


To Kingston
Shannonville
Road
BELLEVILLE
Front
8.
Cannifton
6.
4.
Madoc
Road
Tweed
7.
Road
Foxboro
5.
Wallbridge
3.
Frankford Road
2.
Road
To Toronto
Scale of miles. 1. 2. 3
1 ½ 0

RIVER ROAD—Station No. 8—South of Town Line of Sarnia and Moore

Saturday, August 1, to Friday, August 7, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Wed. Fair	Thur. Fair	Fri. Fair	Total	Daily Average
One horse light vehicle.....	29	32	26	25	22	36	17	187	26.8
One horse heavy vehicle	11	1	8	10	3	5	7	45	6.4
Two horse light vehicle	2	3	.....	.....	2	.....	3	10	1.4
Two horse heavy vehicle ...	2	.....	4	8	3	1	9	27	3.8
Runabout	5	16	7	4	4	6	1	43	6.1
Touring Car	30	76	34	25	28	27	37	257	36.8
Motor Truck	.....	.....	.....	.....	3	.....	.....	3	0.4
Total	79	128	79	72	65	75	74	572	81.7

Condition of Road:—Gravel road, in fair condition.

Belleville.

Census was taken from Thursday, July 30, to Wednesday, August 5, inclusive. The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Front Road (Sidney Township)	1	2 miles.
2	Frankford Road	2	3½ and 7 miles.
3	Madoc Road	2	1 and 5½ miles.
4	Tweed Road	2	1½ and 7 miles.
5	Front Road (Thurlow Township)	1	3 miles.
		8	

There is a brewery situated at Cannifton on Tweed Road, which causes the two-horse heavy vehicle traffic.

On Tweed Road there is a heavy market and farming traffic; farmers come quite a distance to market on this road.

The roads adjacent to city are built of stone and are in fair condition.

FRONT ROAD (SIDNEY TOWNSHIP)—Station No. 1—Lot 31, Concession I, Sidney Township.

Thursday, July 30, to Wednesday, August 5, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fine	Fri. Fine	Sat. Fair	Sun. Cloudy	Mon. Fair	Tues. Fair	Wed. Fair	Total	Daily Average
One horse light vehicle.....	74	79	91	90	63	68	87	552	78.9
One horse heavy vehicle	38	26	48	18	34	27	23	214	30.6
Two horse light vehicle ...	11	30	39	2	4	6	5	97	13.8
Two horse heavy vehicle ...	23	37	34	.....	36	55	31	216	30.8
Runabout	7	6	7	4	5	5	10	44	6.3
Touring Car	60	57	57	87	54	30	80	425	60.7
Motor Truck	1	2	2	.....	2	1	1	9	1.3
Total	214	237	278	201	198	192	237	1,557	222.4

Condition of Road:—Stone road, in good condition.

FRANKFORD ROAD—Station No. 2—Gilbert School House (Lot 30, Concession III, Sidney Township).

Thursday, July 30, to Wednesday, August 5, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Wed. Fine	Total	Daily Average
One horse light vehicle	21	22	70	40	37	27	23	240	34.3
One horse heavy vehicle	9	.....	9	1	2	3	3	27	3.8
Two horse light vehicle	7	5	10	3	1	6	2	34	4.9
Two horse heavy vehicle	7	7	15	.....	15	11	10	65	9.2
Runabout	.....	1	1	1	2	1	3	9	1.3
Touring Car	10	10	9	12	5	12	5	63	9.0
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	54	45	114	57	62	60	46	438	62 5

Condition of Road:—Stone road, a little rough.

FRANKFORD ROAD—Station No. 3—Wallbridge.

Thursday, July 30, to Wednesday, August 5, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fair	Sat. Fine	Sun. Fair	Mon. Fair	Tues. Fair	Wed. Fair	Total	Daily Average
One horse light vehicle	24	25	33	45	32	27	20	206	29.4
One horse heavy vehicle	5	.....	.....	.....	.....	2	.....	7	1.0
Two horse light vehicle	3	4	11	2	1	1	1	23	3.3
Two horse heavy vehicle	9	11	15	.....	20	15	17	87	12.5
Runabout	.....	1	.....	.....	2	1	.....	4	0.5
Touring Car	8	8	4	11	2	6	8	47	6.7
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	49	49	63	58	57	52	46	374	53.4

Condition of Road:—Stone road, in good condition.

MADOC ROAD—Station No. 4—Lot 4, Concession II, Thurlow Township.

Thursday, July 30, to Wednesday, August 5, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fain	Fri. Fine	Sat. Fine	Sun. Fair	Mon. Fine	Tues. Fine	Wed. Fine	Total	Daily Average
One horse light vehicle	63	42	120	53	39	54	43	414	59.1
One horse heavy vehicle	36	32	79	7	30	32	35	251	35.9
Two horse light vehicle	24	13	52	2	16	29	25	161	23.0
Two horse heavy vehicle	4	9	15	3	6	9	8	54	7.7
Runabout	.....	5	4	7	7	9	1	33	4.7
Touring Car	45	46	54	52	41	31	19	288	41.1
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	172	147	324	124	139	164	131	1,201	171.5

Condition of Road:—Stone road, in good condition.

MADOC ROAD—Station No. 5—Foxboro.

Thursday, July 30, to Wednesday, August 5, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fine	Sat. Fine	Sun. Fine	Mon. Fine	Tues. Fine	Wed. Fair	Total	Daily Average
One horse light vehicle.....	39	37	125	73	28	48	49	399	57.0
One horse heavy vehicle	16	9	25	.....	7	8	6	71	10.1
Two horse light vehicle	14	7	62	4	7	8	4	106	15.1
Two horse heavy vehicle ...	16	11	15	.....	12	28	10	92	13.2
Runabout	7	6	5	3	5	.....	2	28	4.0
Touring Car	41	44	46	43	22	27	16	239	34.1
Motor Truck	1	2	.....	2	.....	.....	.....	5	0.7
Total	134	116	278	125	81	119	87	940	134.2

Condition of Road:—Stone road, in good condition.

TWEED ROAD—Station No. 6—Cannifton

Thursday, July 30, to Wednesday, August 5, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Wed. Fair	Total	Daily Average
One horse light vehicle.....	174	77	265	72	75	77	87	827	118.1
One horse heavy vehicle	19	8	34	1	13	23	17	115	16.4
Two horse light vehicle	22	7	86	1	15	16	9	156	22.2
Two horse heavy vehicle ...	44	19	36	.....	14	35	25	173	24.7
Runabout	2	1	1	1	1	5	3	14	2.0
Touring Car	14	18	19	19	13	20	12	115	16.7
Motor Truck	5	1	.....	1	.....	1	.....	8	1.1
Total	280	131	441	95	131	177	153	1,408	201.2

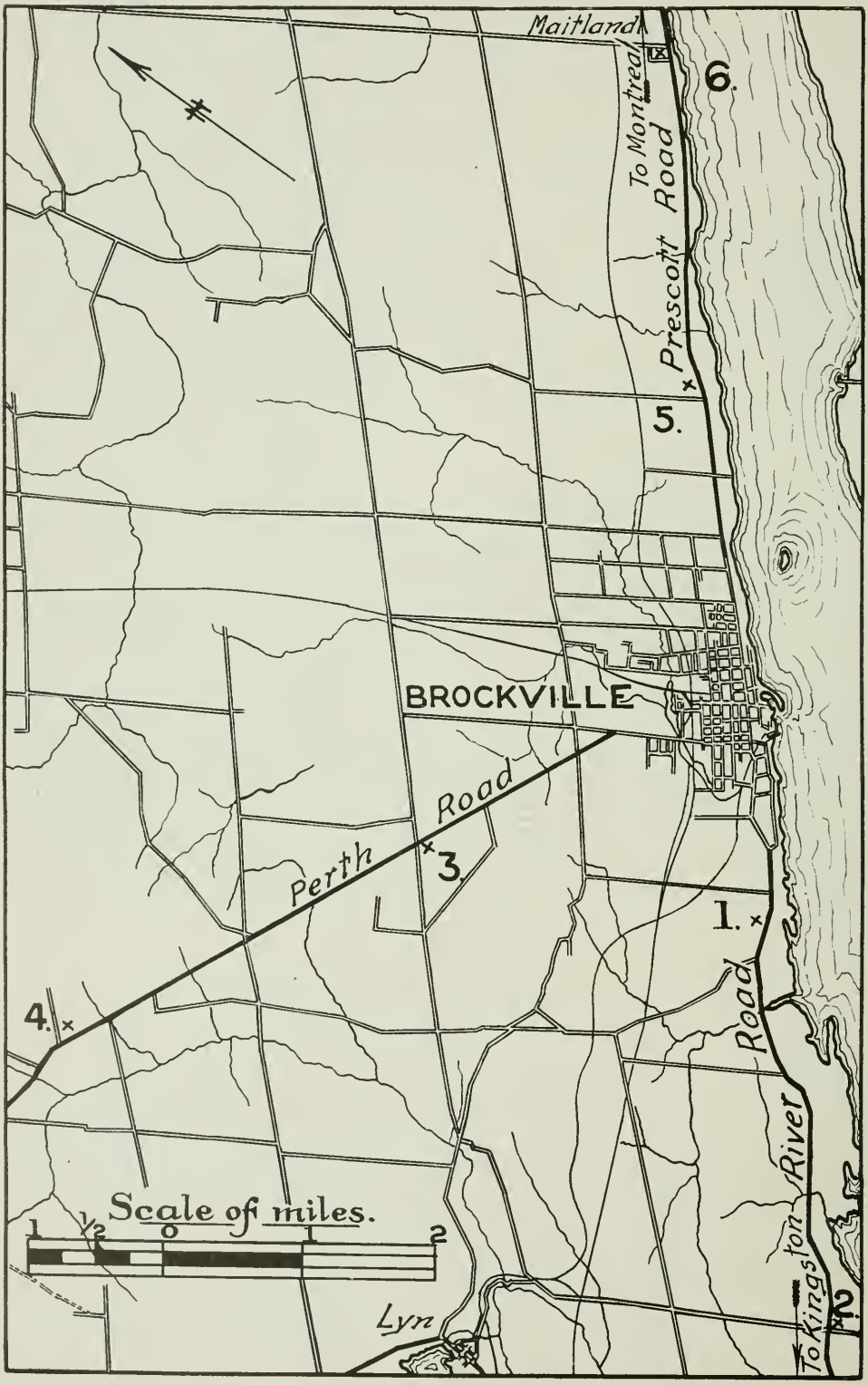
Condition of Road:—Stone road, in fair condition.

TWEED ROAD—Station No. 7—South of Thrasher's Corners

Thursday, July 30, to Wednesday, August 5, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fair	Sat. Fine	Sun. Fine	Mon. Fine	Tues. Fine	Wed. Fine	Total	Daily Average
One horse light vehicle.....	42	28	111	42	35	35	37	330	47.1
One horse heavy vehicle	3	4	12	.....	1	4	6	30	4.2
Two horse light vehicle ...	5	4	58	4	9	11	8	99	14.2
Two horse heavy vehicle ...	10	8	21	.....	12	18	9	78	11.1
Runabout	6	2	.....	3	2	3	6	22	3.2
Touring Car	4	11	4	12	9	12	10	62	8.9
Motor Truck	.....	3	.....	.....	.....	2	.....	5	0.7
Total	70	60	206	61	68	85	76	626	89.4

Condition of Road:—Stone road, in good condition.


Maitland
To Montreal
Prescott Road
6.
5.
BROCKVILLE
Perth Road
3.
1.
4.
Road
River
To Kingston
Scale of miles.
1 1/2 0 1 2
Lyn

FRONT ROAD (Thurlow Township)—Station No. 8—Junction of Road to Point Anne.

Thursday, July 30, to Wednesday, August 5, inclusive; 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fine	Fri. Fine	Sat. Cloudy	Sun. Cloudy	Mon. Fine	Tues. Fine	Wed. Fine	Total	Daily Average
One horse light vehicle	61	36	105	56	66	35	79	438	62.5
One horse heavy vehicle	29	28	43	8	29	23	23	183	26.2
Two horse light vehicle	4	2	7	5	1	2	10	31	4.4
Two horse heavy vehicle	21	8	11	4	14	13	24	95	13.6
Runabout	2	.....	1	.....	2	1	2	8	1.2
Touring Car	29	25	24	27	23	25	32	185	26.4
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	146	99	191	100	135	99	170	940	134.3

Condition of Road:—Stone road, very rough.

Brockville

Census was taken from Wednesday, July 29, to Tuesday, August 4, inclusive. The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	River Road	2	½ and 4 miles.
2	Perth Road	2	2½ and 5 miles.
3	Prescott Road	2	1½ and 5 miles.
		6	

The Prescott Road is a toll road, built of stone and in poor condition; the state of the road has been a subject of much complaint. While the census was being taken, the city had a part of this road within the city limits closed, and the traffic was diverted on roads to the north. These roads were so badly cut up that a large amount of motor traffic avoided the Prescott Road entirely.

The River Road is used mostly by the residents, there being a large number of summer homes on the bank of the river; but if this road was properly built it would undoubtedly carry most of the through traffic.

RIVER ROAD—Station No. 1—Junction of Lyn Road.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fine	Thur. Fine	Fri. Fine	Sat. Cloudy	Sun. Cloudy	Mon. Fine	Tues. Fine	Total	Daily Average
One horse light vehicle	106	133	90	161	101	122	114	827	118.1
One horse heavy vehicle	115	96	96	133	25	59	111	635	90.7
Two horse light vehicle	38	48	22	40	39	27	56	270	38.6
Two horse heavy vehicle	32	36	24	51	.....	19	43	205	29.3
Runabout	9	16	12	11	23	12	8	91	13.0
Touring Car	108	118	104	143	122	153	119	867	123.9
Motor Truck	.....	.....	.....	.....	4	2	.....	6	0.8
Total	408	447	348	539	314	394	451	2,901	414.4

Condition of Road:—Stone road, in good condition.
Remarks:—This count includes traffic from Lyn Road.

RIVER ROAD—Station No. 2—Lot 28, Concession I, Elizabethtown Township.

Friday, July 31, to Thursday, August 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Cloudy	Sat. Fair	Sun. Rain	Mon. Fair	Tues. Fine	Wed. Fine	Thur. Fine	Total	Daily Average
One horse light vehicle	26	37	24	12	25	18	31	173	24.7
One horse heavy vehicle	11	11	4	21	11	17	16	91	13.0
Two horse light vehicle	7	8	.....	7	9	10	7	48	6.9
Two horse heavy vehicle	21	9	.....	6	5	12	2	55	7.9
Runabout	3	3	7	2	6	1	8	30	4.3
Touring Car	.....	4	5	4	2	2	3	20	2.8
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	68	72	40	52	58	60	67	417	59.6

Condition of Road:—Stone road in parts, bad in wet weather; part of road is solid rock.

PERTH ROAD—Station No. 3—Beaches Corners.

Friday, July 31, to Thursday, August 6, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Fri. Fine	Sat. Fine	Sun. Rain	Mon. Fine	Tues. Fine	Wed. Fine	Thur. Fine	Total	Daily Average
One horse light vehicle	50	104	45	40	52	41	78	410	58.6
One horse heavy vehicle	14	67	2	11	23	11	54	182	26.0
Two horse light vehicle	9	18	.....	.....	6	6	8	47	6.7
Two horse heavy vehicle	12	22	.....	15	32	36	45	162	23.1
Runabout	2	4	6	2	2	4	6	26	3.7
Touring Car	20	26	35	34	26	33	55	229	32.7
Motor Truck	.....	.....	.....	.....	3	.....	4	7	1.0
Total	102	241	88	102	144	131	250	1,063	151.8

Condition of Road:—Stone road, in good condition.

PERTH ROAD—Station No. 4—Lot 21, Concession IV, Elizabethtown Township.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Cloudy	Thur. Fair	Fri. Cloudy	Sat. Fair	Sun. Rain	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle	9	61	31	88	42	39	31	301	43.0
One horse heavy vehicle	9	14	21	32	2	14	14	106	15.1
Two horse light vehicle	3	7	3	11	.....	7	2	33	4.7
Two horse heavy vehicle	6	10	13	24	.....	5	22	80	11.4
Runabout	2	5	.....	6	7	.....	8	28	4.0
Touring Car	14	33	21	31	34	29	29	191	27.3
Motor Truck	.....	.....	.....	.....	.....	.....	4	4	0.6
Total	43	130	89	192	85	94	110	743	106.1

Condition of Road:—Stone road, in good condition.

PRESCOTT ROAD—Station No. 5—Lot 1, Concession 1, Elizabethtown Township.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Shwry	Thur. Fine	Fri. Fine	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Fair	Total	Daily Average
One horse light vehicle.....	32	25	19	28	32	30	36	202	28.9
One horse heavy vehicle.....	17	25	21	35	3	8	33	142	20.3
Two horse light vehicle	.....	2	1	.....	.....	.....	3	6	0.8
Two horse heavy vehicle ...	9	8	5	19	2	6	13	62	8.9
Runabout	6	4	3	4	9	5	2	33	4.7
Touring Car	33	25	33	28	38	56	20	233	33.3
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	97	89	82	114	84	105	107	678	96.9

Condition of Road:—(Toll Road). Stone road, in very poor condition, badly rutted.

PRESCOTT ROAD—Station No. 6—Maitland.

Wednesday, July 29, to Tuesday, August 4, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Wed. Fair	Thur. Fair.	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fine	Tues. Fair	Total	Daily Average
One horse light vehicle.....	28	16	14	9	24	17	15	123	17.6
One horse heavy vehicle	8	12	11	31	4	7	8	81	11.6
Two horse light vehicle	5	3	1	3	5	.....	2	19	2.7
Two horse heavy vehicle ...	10	9	5	16	.....	6	9	55	7.9
Runabout	6	2	3	.....	11	10	2	34	4.8
Touring Car	32	21	38	29	51	38	26	235	33.6
Motor Truck	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	89	63	72	88	95	78	62	547	78.2

Condition of Road:—(Toll Road). Stone road, in very poor condition, badly rutted.

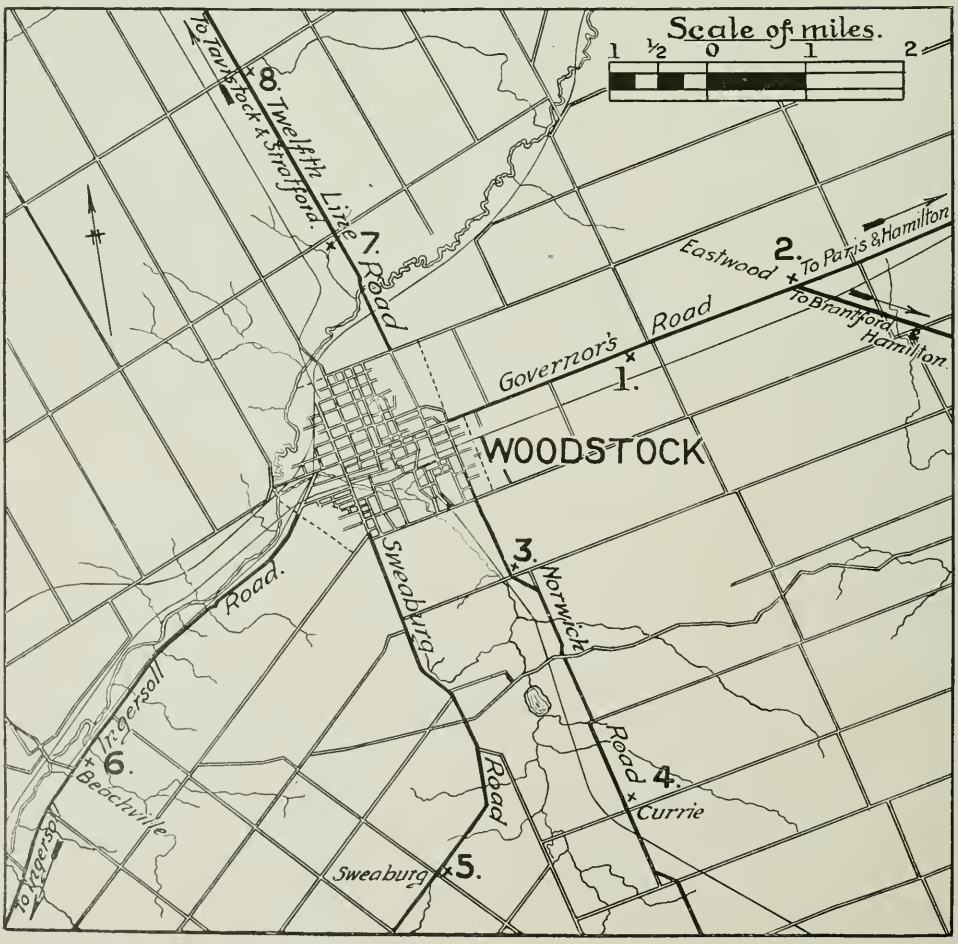
Woodstock.

Census was taken from Thursday, Aug. 13, to Wednesday, Aug. 19, inclusive. The following roads were taken into consideration:—

	Name of Road.	Number of Stations.	Distance from City Limits.
1	Governor's Road	2	2 and 4 miles.
2	Norwich Road	2	1½ and 4 miles.
3	Sweaburg Road	1	4½ miles.
4	Ingersoll Road	1	4 miles.
5	Twelfth Line Road	2	1½ and 3½ miles.
		8	

The Ingersoll Road is the heaviest travelled road around the city and is built of stone, but it is in very poor shape; in parts the common practice of trimming shoulders and dumping earth on top of stone has been carried out.

The Governor's and Ingersoll Roads are part of the proposed route from Montreal to Windsor; the traffic on this section is shown in schedules under



Stations 1, 2 and 6. These roads carry quite a lot of through motor traffic from Hamilton to London; if they were improved to a modern standard, this traffic would be very heavy.

The Twelfth Line Road is a stone road and the best adjacent to the city.

GOVERNOR'S ROAD—Station No. 1—Lot 13, Concession I, Blandford Township.

Thursday, August 13, to Wednesday, August 19, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Rain	Fri. Fine	Sat. Fine	Sun. Rain	Mon. Fine	Tues. Fine	Wed. Rain	Total	Daily Average
One horse light vehicle.....	54	50	138	49	35	38	33	397	56.7
One horse heavy vehicle	4	12	35	.....	10	18	11	90	12.9
Two horse light vehicle	1	.....	8	2	6	2	3	22	3.1
Two horse heavy vehicle ...	6	28	21	.....	17	14	12	98	14.0
Runabout	15	3	11	25	6	2	4	66	9.4
Touring Car	64	54	70	63	35	28	22	336	48.0
Motor Truck	2	.....	2	.....	3	5	6	18	2.6
Total	146	147	285	139	112	107	91	1,027	146.7

Condition of Road:—Stone road, in poor condition.

GOVERNOR'S ROAD—Station No. 2—Eastwood.

Thursday, August 13, to Wednesday, August 19, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Shwry	Fri. Fair	Sat. Fine	Sun. Cloudy	Mon. Fair	Tues. Rain	Wed. Shwry	Total	Daily Average
One horse light vehicle.....	26	31	102	25	33	25	33	275	39.3
One horse heavy vehicle	1	.....	7	.....	2	3	1	14	2.0
Two horse light vehicle	3	4	16	2	9	5	6	45	6.4
Two horse heavy vehicle ...	5	22	9	.....	23	18	20	97	13.9
Runabout	7	1	8	16	3	3	5	43	6.1
Touring Car.....	50	44	57	54	32	19	16	272	38.9
Motor Truck	4	.....	2	.....	2	5	6	19	2.7
Total	96	102	201	97	104	78	87	765	109.3

Condition of Road:—Stone road, in poor condition.

NORWICH ROAD—Station No. 3—Lot 18, Concession IV, East Oxford Township.

Thursday, August 13, to Wednesday, August 19, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Rain	Fri. Fine	Sat. Fine	Sun. Shwry	Mon. Fine	Tues. Rain	Wed. Fair	Total	Daily Average
One horse light vehicle.....	77	64	132	77	67	59	82	558	79.7
One horse heavy vehicle	30	43	61	.....	43	29	37	243	34.7
Two horse light vehicle	8	6	10	6	6	5	10	51	7.3
Two horse heavy vehicle....	20	25	30	.....	25	32	30	162	23.1
Runabout	4	3	9	6	4	1	3	30	4.3
Touring Car	13	17	31	21	21	6	7	116	16.6
Motor Truck	3	2	2	.....	.....	4	.....	11	1.6
Total	155	160	275	110	166	136	169	1,171	167.3

Condition of Road:—Stone road, in poor condition.

NORWICH ROAD—Station No. 4—Currie's Crossing.

Thursday, August 13, to Wednesday, August 19, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Rain	Fri. Fine	Sat. Fine	Sun. Cloudy	Mon. Fine	Tues. Fine	Wed. Fine	Total	Daily Average
One horse light vehicle	40	64	97	43	43	43	66	396	56.6
One horse heavy vehicle	17	32	47	2	29	23	38	188	26.9
Two horse light vehicle	.....	7	.....	4	5	1	7	24	3.4
Two horse heavy vehicle	18	28	23	.....	25	16	20	130	18.6
Runabout	.....	1	6	14	1	1	4	27	3.8
Touring Car	7	7	17	27	20	4	5	87	12.4
Motor Truck	2	2	2	.....	.....	5	.....	11	1.6
Total	84	141	192	90	123	93	140	863	123.3

Condition of Road:—Stone road, in poor condition.

SWEABURG ROAD—Station No. 5—Sweaburg.

Thursday, August 13, to Wednesday, August 19, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Rain	Fri. Fine	Sat. Fair	Sun. Rain	Mon. Fine	Tues. Cloudy	Wed. Rain	Total	Daily Average
One horse light vehicle	16	31	30	18	21	15	31	162	23.1
One horse heavy vehicle	9	10	7	1	12	8	7	54	7.7
Two horse light vehicle	6	2	3	2	5	3	1	22	3.1
Two horse heavy vehicle	9	10	11	.....	14	6	2	52	7.4
Runabout	2	.....	1	2	3	.....	.....	8	1.2
Touring Car	7	1	5	4	2	5	1	25	3.6
Motor Truck	3	.....	.....	.....	.....	.....	.....	3	0.4
Total	52	54	57	27	57	37	42	326	46.5

Condition of Road:—Stone road, in poor condition.

INGERSOLL ROAD—Station No. 6—Beachville.

Thursday, August 13, to Wednesday, August 19, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Rain	Fri. Fine	Sat. Fine	Sun. Rain	Mon. Fine	Tues. Fine	Wed. Fine	Total	Daily Average
One horse light vehicle	40	87	104	82	71	81	125	590	84.3
One horse heavy vehicle	29	47	50	.....	36	30	47	239	34.1
Two horse light vehicle	1	3	1	1	4	4	4	18	2.6
Two horse heavy vehicle	28	39	47	.....	40	28	66	248	35.4
Runabout	15	21	23	31	21	15	4	130	18.6
Touring Car	188	64	94	86	75	27	32	566	80.9
Motor Truck	2	5	4	.....	1	6	6	24	3.4
Total	303	266	323	200	248	191	284	1,815	259.3

Condition of Road:—Stone road, in poor condition.

TWELFTH LINE ROAD—Station No. 7—Lot 5, Con XII, East Zorra Township.
Thursday, August 13, to Wednesday, August 19, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Rain	Fri. Fine	Sat. Fair	Sun. Fine	Mon. Fine	Tues. Cloudy	Wed. Fine	Total	Daily Average
One horse light vehicle	71	72	131	109	80	89	86	638	91.1
One horse heavy vehicle	25	30	44	12	33	29	35	208	29.7
Two horse light vehicle	4	1	8	1	8	3	14	39	5.6
Two horse heavy vehicle	26	63	28	.....	40	32	27	216	30.9
Runabout	2	11	5	36	12	2	3	71	10.1
Touring Car	52	40	40	63	45	26	22	288	41.1
Motor Truck	3	2	2	3	6	.....	.....	16	2.3
Total	183	219	258	224	224	181	187	1,476	210.8

Condition of Road:—Stone road, in good condition.

TWELFTH LINE ROAD—Station No. 8—Lot 10, Concession XII, East Zorra Township.
Thursday, August 13, to Wednesday, August 19, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Rain	Fri. Fair	Sat. Fair	Sun. Rain	Mon. Fair	Tues. Fair	Wed. Fair	Total	Daily Average
One horse light vehicle	23	31	70	33	38	24	39	258	36.9
One horse heavy vehicle	5	6	17	.....	10	10	7	55	7.9
Two horse light vehicle	3	.....	5	.....	.....	.....	9	17	2.4
Two horse heavy vehicle	8	10	8	.....	7	8	7	48	6.9
Runabout	4	9	3	27	8	.....	3	54	7.7
Touring Car	33	27	31	52	36	13	19	211	30.1
Motor Truck	1	1	1	1	2	1	.....	7	1.0
Total	77	84	135	113	101	56	84	650	92.9

Condition of Road:—Stone road, in good condition.

Niagara Falls.

Census was taken from Thursday, Aug. 6, to Wednesday, Aug. 12, inclusive. The following roads were taken into consideration:—

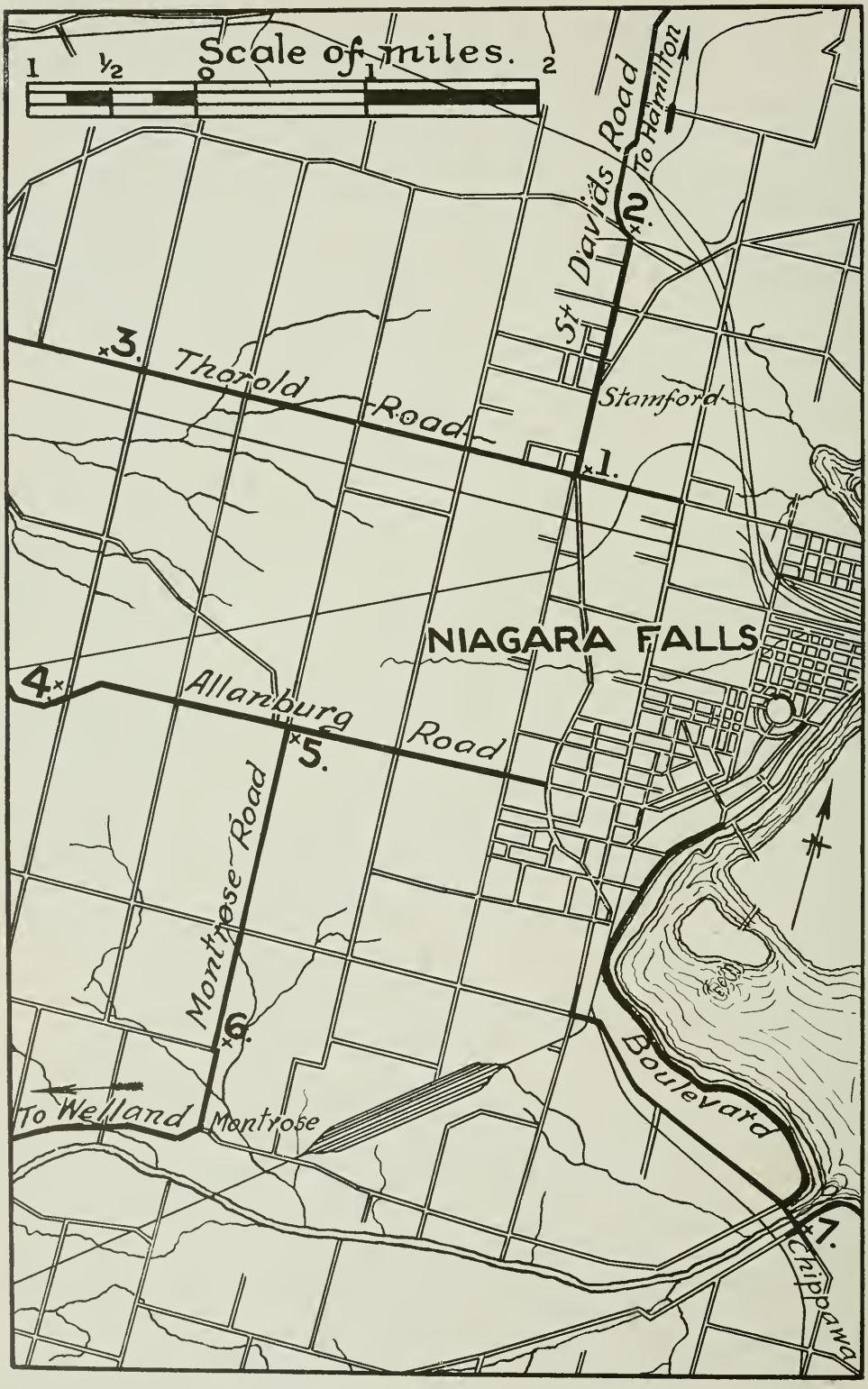
	Name of Road.	Number of Stations.	Distance from City Limits.
1	Thorold Stone Road	2	1½ and 4½ miles.
2	St. David's Road	2	1½ and 4 miles.
3	Allanburg Road (Lundy's Lane)	2	2½ and 4½ miles.
4	Montrose Road	2	2½ and 4½ miles.
5	Niagara Boulevard	1	3 miles.
		9 (represented by 7 stations on map).	

The St. David's Road carries a large through motor traffic from St. Catharines and beyond. This stone road is in fair condition, with surface treated with oil. There is a very bad sand hill near St. David's where this road joins the Queenston Road.

Allanburg Road is commonly called Lundy's Lane: traffic on this road is shown in schedules under Station 4 and 5.

The Niagara Boulevard carries a very heavy motor traffic, and is a tar-treated road as far as Fort Erie. There is a constant motor traffic on this road after 7 p.m. A large amount of motor traffic from Buffalo uses this road.

The other roads adjacent to the city are built of stone and in very poor condition.


Scale of miles.
1 ½ 0 1 2
St. Davids Road
To Hamilton
2.
3.
Thorold Road
Stamford
1.
NIAGARA FALLS
4.
Allanburg Road
5.
Montrose Road
6.
To Welland
Montrose
Boulevard
7.
Chippawa

THOROLD STONE ROAD.—Station No. 1—Southend (Junction of St. David's Road).

Including traffic from St. David's Road.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fair	Sat. Fine	Sun. Rain	Mon. Fine	Tues. Fine	Wed. Fair	Total	Daily Average
One horse light vehicle	106	124	168	69	120	177	95	859	122.7
One horse heavy vehicle	4	12	4	.....	11	7	18	56	8.0
Two horse light vehicle	3	3	12	2	13	7	4	44	6.3
Two horse heavy vehicle	34	70	79	.....	54	62	77	376	53.7
Runabout	16	15	26	34	19	25	17	152	21.7
Touring Car	118	117	155	261	88	81	148	968	138.3
Motor Truck	2	13	8	.....	6	5	9	43	6.1
Total	283	354	452	366	311	364	368	2,498	356.8

Condition of Road:—Stone road, solid, but very rough.

THOROLD STONE ROAD—Station No. 1—Southend (Junction of St. David's Road)

Excluding traffic from St. David's Road.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fair	Sat. Fine	Sun. Rain	Mon. Fine	Tues. Fine	Wed. Fair	Total	Daily Average
One horse light vehicle	50	59	78	26	50	76	32	371	53.0
One horse heavy vehicle	2	8	2	.....	6	4	8	30	4.3
Two horse light vehicle	1	2	5	1	5	3	3	20	2.8
Two horse heavy vehicle	14	23	52	.....	23	34	27	173	24.7
Runabout	5	5	15	7	6	8	3	49	7.0
Touring Car	54	54	85	92	33	32	48	398	56.9
Motor Truck	.....	7	5	.....	3	3	1	19	2.7
Total	126	158	242	126	126	160	122	1,060	151.4

Condition of Road:—Stone road, in fair condition.

THOROLD STONE ROAD—Station No. 3—Lot 68, Stamford Township.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fine	Mon. Fine	Tues. Rain	Wed. Fine	Total	Daily Average
One horse light vehicle	8	11	10	9	8	15	9	70	10.0
One horse heavy vehicle	2	2	3	.....	1	9	1	18	2.5
Two horse light vehicle	2	.....	2	.....	2	1	.....	7	1.0
Two horse heavy vehicle	3	6	4	.....	11	12	11	47	6.8
Runabout	3	1	.....	2	.....	3	.....	9	1.2
Touring Car	5	5	2	11	2	4	3	32	4.5
Motor Truck	.....	3	.....	.....	.....	2	.....	5	0.8
Total	23	28	21	22	24	46	24	188	26.8

Condition of Road:—Stone road, solid, but very rough.

ST. DAVID'S ROAD—Station No. 1—Southend (Junction of Thorold Stone Road).

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fair	Sat. Fine	Sun. Rain	Mon. Fine	Tues. Fine	Wed. Fair	Total	Daily Average
One horse light vehicle.....	56	65	90	43	70	101	63	488	69.7
One horse heavy vehicle.....	2	4	2	.....	5	3	10	26	3.7
Two horse light vehicle.....	2	1	7	1	8	4	1	24	3.4
Two horse heavy vehicle.....	20	47	27	.....	31	28	50	203	29.0
Runabout	11	10	11	27	13	17	14	103	14.7
Touring Car	64	63	70	169	55	49	100	570	81.4
Motor Truck	2	6	3	.....	3	2	8	24	3.4
Total	157	196	210	240	185	204	246	1,438	205.3

Condition of Road:—Stone road, in fair condition; surface treated with oil.

ST. DAVID'S ROAD—Station No. 2—South of Grand Trunk Railway Crossing.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fair	Sat. Fair	Sun. Fair	Mon. Fair	Tues. Shwry	Wed. Fair	Total	Daily Average
One horse light vehicle.....	46	43	78	23	35	45	30	300	42.9
One horse heavy vehicle	16	33	26	7	43	41	37	203	29.0
Two horse light vehicle	1	.....	15	1	1	.....	1	19	2.7
Two horse heavy vehicle ...	13	22	28	.....	13	31	35	142	20.3
Runabout	12	4	18	5	9	12	10	70	10.0
Touring Car	83	87	123	224	81	70	114	782	111.7
Motor Truck.....	2	12	8	.....	8	4	7	41	5.8
Total	173	201	296	260	190	203	234	1,557	222.4

Condition of Road:—Stone road, in fair condition; surface treated with oil.

ALLANBURG ROAD (LUNDY'S LANE)—Station No. 5—Junction of Montrose Road.

Including traffic from Montrose Road.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fair	Mon. Fine	Tues. Fair	Wed. Fine	Total	Daily Average
One horse light vehicle.....	136	123	187	120	184	140	144	1,034	147.7
One horse heavy vehicle	3	16	20	.....	30	33	19	121	17.3
Two horse light vehicle	3	13	18	39	24	36	21	154	22.0
Two horse heavy vehicle.....	40	68	85	7	130	131	107	568	81.2
Runabout	41	39	41	78	70	61	57	387	55.2
Touring Car	31	21	28	57	48	39	36	260	37.1
Motor Truck.....	.....	.....	6	6	12	10	14	48	6.9
Total	254	280	385	307	498	450	398	2,572	367.4

Condition of Road:—Stone road, solid, but very rough.

ALLANBURG ROAD (LUNDY'S LANE)—Station No. 5—Junction of Montrose Road.

Excluding traffic from Montrose Road.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fair	Mon. Fine	Tues. Fair	Wed. Fine	Total	Daily Average
One horse light vehicle.....	114	105	143	91	125	116	120	814	116.3
One horse heavy vehicle	2	14	15	.....	16	22	13	82	11.7
Two horse light vehicle.....	1	12	12	24	10	28	13	100	14.3
Two horse heavy vehicle.....	25	54	60	5	91	109	89	433	61.9
Runabout	35	29	28	46	35	52	45	270	38.5
Touring Car	26	17	20	36	29	32	32	192	27.4
Motor Truck	.....	.....	4	6	6	6	10	32	4.6
Total	203	231	282	208	312	365	322	1,923	274.7

Condition of Road:—Stone road, in fair condition.

ALLANBURG ROAD (LUNDY'S LANE)—Station No. 4—East of Grand Trunk Railway Crossing.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Shwry	Mon. Shwry	Tues. Shwry	Wed. Fine	Total	Daily Average
One horse light vehicle	24	24	23	28	26	46	24	195	27.9
One horse heavy vehicle.....	7	3	11	.....	1	4	8	34	4.8
Two horse light vehicle	2	.....	3	.....	3	20	1	29	4.1
Two horse heavy vehicle ...	18	23	15	1	17	32	20	126	18.0
Runabout	1	2	.....	.....	.....	.....	1	4	0.6
Touring Car	19	11	11	43	4	3	20	111	15.9
Motor Truck	2	.....	.....	.....	.....	7	5	14	2.0
Total	73	63	63	72	51	112	79	513	73.3

Condition of Road:—Stone road, in fair condition.

MONTROSE ROAD—Station No. 5—Junction of Allanburg Road.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fair	Mon. Fine	Tues. Fair	Wed. Fine	Total	Daily Average
One horse light vehicle.....	22	18	44	29	59	24	24	220	31.4
One horse heavy vehicle	1	2	5	.....	14	11	6	39	5.6
Two horse light vehicle	2	1	6	15	14	8	8	54	7.7
Two horse heavy vehicle ...	15	14	25	2	39	22	18	135	19.3
Runabout	6	10	13	32	35	9	12	117	16.7
Touring Car	5	4	8	21	19	7	4	68	9.7
Motor Truck	.....	.....	2	.....	6	4	4	16	2.3
Total	51	49	103	99	186	85	76	649	92.7

Condition of Road:—Stone road, solid, but very rough.

MONTROSE ROAD—North of Montrose P.O.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fair	Fri. Fine	Sat. Fair	Sun. Fine	Mon. Fair	Tues. Fair	Wed. Fair	Total	Daily Average
One horse light vehicle.....	60	32	49	41	48	51	78	359	51.3
One horse heavy vehicle ...	.....	.....	.....	.....	.....	.....	2	2	0.3
Two horse light vehicle	4	4	4	.....	6	2	12	32	4.5
Two horse heavy vehicle ...	28	24	18	2	14	5	14	105	15.0
Runabout	5	.....	.....	2	.....	3	1	11	1.5
Touring Car	13	17	13	41	7	2	17	110	15.7
Motor Truck	.....	.....	1	3	2	.....	4	10	1.5
Total	110	77	85	89	77	63	128	629	89.8

Condition of Road:—Stone road, solid, but rough.

NIAGARA BOULEVARD—Bridge over Chippawa Creek.

Thursday, August 6, to Wednesday, August 12, inclusive, 7 a.m. to 7 p.m.

Class of Traffic	Thur. Fine	Fri. Fine	Sat. Fine	Sun. Fine	Mon. Fine	Tues. Fine	Wed. Fine	Total	Daily Average
One horse light vehicle.....	53	60	94	81	46	75	50	459	65.6
One horse heavy vehicle ...	22	32	68	29	38	25	32	246	35.1
Two horse light vehicle	7	15	14	7	5	15	3	66	9.4
Two horse heavy vehicle ...	22	63	42	64	19	27	38	275	39.3
Runabout	33	39	48	11	19	19	23	192	27.4
Touring Car	181	126	260	165	123	227	135	1,217	173.9
Motor Truck	1	10	13	6	4	13	15	62	8.9
Total	319	345	539	363	254	401	296	2,517	359.6

Condition of Road:—Stone road, with surface treated with tar and sand, in good condition.
Remarks:—This count includes the traffic from the Stone Road running parallel to (and using the same bridge as) the Niagara Boulevard. The Stone Road carries all the heavy traffic; the Boulevard, which is treated with tar, carries all the motor traffic, a large percentage of which comes from Buffalo.

Your obedient servant,

ROBT. C. MUIR.
Assistant Engineer.

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Road Congress—Third Session.

PROCEEDINGS

OF THE

Thirteenth Annual Meeting

OF THE

Ontario Good Roads Association

BEING ALSO THE PROCEEDINGS OF THE

Second

Canadian and International Good Roads Congress

And Exhibition

Held at Convocation Hall, Toronto
March 22nd, 23rd, 24th, 25th and 26th

1915

Appended to the Annual Report of the Provincial Engineer of Highways

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1915

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TORONTO.

SECOND CANADIAN AND INTERNATIONAL GOOD ROADS CONGRESS

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David Clow, Leeds County.

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To the Honourable F. G. Macdiarmid,

Minister of Public Works, Ontario.

Sir,—I have the honour to transmit, for publication as an appendix to the Annual Report of this Office, the proceedings of the Thirteenth Annual Meeting of the Ontario Good Roads Association, held in Convocation Hall, University of Toronto, on March 22nd to 26th, inclusive, with which was united the Second Annual Meeting of the Dominion Good Roads Association and an Exhibition of Road Machinery and Materials.

I have the honour to be,

Sir,

Your obedient servant,

W. A. McLean,
Chief Engineer of Highways.

Parliament Buildings, Toronto,
3rd April, 1915.

INVOCATION

Rev. Dr. J. W. Graham, Superintendent of Education for the Methodist Church of Canada:

O God, we thank Thee that we can approach Thee as our Father. Thou hast created us in Thine own Image and made us for Thyself, and we are restless until we find our rest in Thee. We cannot work our work or will our will, unless Thou dost impart to us power and co-operate with us. As we walk down the roadways of life, we pray Thee that we may have the constant sense that Thou art not very far from every one of us, and that One walks beside us in the way Who has a Form like unto the Son of God. At this time of strife and crisis, O God of nations, we pray Thee to give that wisdom that cometh from above unto those who mould the destinies of nations. We pray Thee to bless our sailors and soldiers and grant unto them courage and strength. Bless those who tarry at home anxiously waiting, perhaps, evil tidings. Comfort those who are sitting curtained about with the shadows of a great unspoken grief. O Lord, grant that out of this great world struggle there may come a wider and truer liberty and a greater emphasis upon the sacredness of human life, and a deeper sense of honour and brotherhood and peace with righteousness, a lasting peace, because based upon righteousness.

Grant Thy Blessing, O Lord, richly to rest upon this Convention. Regard all its undertakings with Divine Favour. Guide all its deliberations that the results that will emerge from this gathering may be useful and for the betterment of mankind. We pray Thee to help us to remove the institutions from the side of the road that are a menace to the safety and well-being of the wayfarers, the saloons that curse and the house of shame that takes hold upon death. May the day soon come when the valley shall be exalted and the mountains shall be made low, and when the grades shall not be too steep for weary feet to climb, when the crooked ways shall be made straight and the rough places smooth, and all flesh shall rejoice together. O God, may we all become Thy Road Builders, making the paths straight and making easier the Highway unto our God, and, when we come to the end of the Road, we pray Thee that we may enter into that rest and peace of our Father's Home, a Home that will never be broken up, a Home that is Eternal in the Heavens.

Grant these requests, we humbly beseech Thee, through Jesus Christ our Lord. Amen.

SECOND CANADIAN AND INTERNATIONAL GOOD ROADS CONGRESS

AND THIRTEENTH ANNUAL MEETING OF THE

Ontario Good Roads Association

FIRST SESSION

Monday Afternoon, March 22nd, 1915

J. A. SANDERSON, ESQ., Vice-President:

We all regret the absence of our good friend Mr. W. A. McLean, the President of this Association. I have pleasure in asking Mr. U. H. Dandurand, our popular Honorary President, to preside at this meeting in Mr. McLean's absence.

U. H. DANDURAND, ESQ., Honorary President, in the Chair:

THE CHAIRMAN: Your Honour, Your Worship, and Gentlemen: I regret for your sake the illness of our good friend Mr. McLean, which prevents him from being present. I feel highly the honour conferred upon me in being asked to preside at this Congress, and I have very great pleasure in inviting the Rev. Dr. Graham to pronounce the Invocation.

THE REV. DR. J. W. GRAHAM, Superintendent of Education for the Methodist Church of Canada, then pronounced the Invocation.

THE CHAIRMAN: I feel that we are indeed honoured to have with us this afternoon His Honour, the Lieutenant-Governor, the Hon. J. S. Hendrie. (Applause.) On your behalf I have very much pleasure in asking the Hon. J. S. Hendrie to open the second annual Canadian and International Good Roads Convention. (Applause.)

ADDRESS.

THE HON. J. S. HENDRIE, LIEUTENANT-GOVERNOR OF THE PROVINCE OF ONTARIO.

Mr. President, Ladies and Gentlemen:

It is indeed quite a source of pleasure to me, representing the Province of Ontario, to welcome not only the delegates from Ontario, but those from our neighbouring provinces. I am sure the delegates from the Province of Ontario and those who comprise the Good Roads Association are very pleased to see so many gentlemen from the neighbouring Republic who have come here to take part in this very important assembly. I notice, sir, that you have decided that good roads must come. You are not going to discuss the question of whether there are to be Good Roads or not, but having decided on Good Roads, you are

taking up a larger question, and you are going to have papers read on finance and construction, and also on one of the most important matters, that of maintenance. I believe you will give attention to the various engineering features connected with Good Roads. Important consideration will be given to the kind of roads that will suit particular localities. I also notice that you have here a very good exhibit and a practical demonstration, in a miniature way, of how Good Roads should be built.

I am pleased that you are meeting in this large Convocation Hall. There are so many students from the Engineering branch of the School of Practical Science who will attend these meetings and will obtain a lot of practical information first-hand that they would probably not gain in any other way.

The Province of Ontario is now contemplating a really good road between this city and the City of Hamilton. It is the first large work of that character that has been undertaken in this Province, and a great deal will depend on how that work is carried out. I am sure that the Commission that has started it will see that from an engineering and from a structural point of view it receives their best attention, because that road will have to be an example to the rest of the Province and an encouragement to build other roads of a similar character.

Mr. President, it gives me much pleasure to declare this Convention open, and again to express to you the pleasure I have in welcoming the delegates and the gentlemen who are to read papers and the delegates from the neighbouring Republic, whose sympathy we value so highly at the present time. I thank you, gentlemen. (Applause.)

THE CHAIRMAN: I now have much pleasure in calling upon the Hon. Finlay G. Macdiarmid, Minister of Public Works for the Province of Ontario, to address you.

ADDRESS.

THE HON. FINLAY G. MACDIARMID, MINISTER OF PUBLIC WORKS, PROVINCE OF ONTARIO.

I am pleased indeed to have the opportunity and privilege of meeting this body of men, who are interested in this great question which has taken hold not only of the people of Ontario and the other provinces of this Dominion, but also of the people of the Republic to the south of us. I am very pleased indeed to see representatives from the different Provinces, and from the States of the great American Republic here to-day. As His Honour the Lieutenant-Governor has pointed out, you are dealing with one of the most important questions which we, as a people, have to solve. It is unnecessary for me, in addressing a body of men who have given this question every consideration for many years past, to call attention to its magnitude. The problem we will have to face is difficult for one or two reasons which I may mention; the immense area which we possess is sparsely peopled, while the revenue of the Province, as well as that of the other Provinces, is well defined and limited. Comparing our position with some of the States of the Union or with some of the countries in Europe, it will be found that our position is exactly the reverse of theirs. They have a limited area, a dense population, and almost unlimited revenue.

I am not in a position to speak with regard to the legislation that may, or may not, be introduced in the Legislature. Time alone will determine that.

We are in session at the present time and the matter of Good Roads is receiving the very best consideration of myself as Minister of Public Works and of the Government. For many years an educational campaign has been carried on by the Good Roads Associations in the Province of Ontario and elsewhere. You have laid the foundation by creating a public opinion on this question. It is not any longer necessary to take up time to discuss the advantages, social and economic, of Good Roads; we have passed that point to a very large extent. Some educational work may yet remain to be done, but on the whole, this question meets with a favourable reception wherever it is discussed. The important matter to discuss now is the devising of ways and means to meet the different situations which arise and to finance the different proposals that may come forward. I need not say to you here, gentlemen, that this is not a time for reckless expenditure; it is the duty of the people of this Dominion to wait until the atmosphere has cleared and until this world-wide struggle is determined, before we launch out or become responsible for any great financial undertaking. We have a wealth of literature dealing with the question of Good Roads. I have been very seriously engaged in trying to analyze the different proposals that were reported on by the Commission which examined into this whole question for the Province of Ontario. I think I voice the general sentiments of this audience and of all who have taken an interest in the Good Roads movement when I say that that is a very valuable contribution to the literature bearing on this great question.

I sincerely regret that through illness, Mr. McLean, who is head of the Highways Branch of the Ontario Government, is unable to attend the sessions of this Good Roads Congress. I have no doubt that he will follow, in the sick room, the report of your proceedings. I regret he is not able to be present to listen to your discussion, in order that he might come back to direct and advise the Government, as far as is proper, along the lines that legislation might follow. I was speaking to him over the telephone just before coming here, and he wished me to convey to you his sincere regrets at not being able to be present. I told him that I would tell you that, on account of the state of the roads, he was unable to make the grade. I shall not detain you further, except to trust that the meeting may be profitable from every point of view. I thank you. (Applause.)

THE CHAIRMAN: Last spring, when we had the first Convention at Montreal, it was so successful that I proposed we should make it a permanent institution, a Dominion Good Roads Association. Then and there a Committee was formed, with your good friend Mr. McLean as President, and Mr. Michaud as Vice-President. When the time came for selecting the place of meeting this year, you had an excellent advocate in His Worship, Mayor Church, who was then Controller Church. He was then in training for the Mayoralty. Any man who works for Good Roads and who is in favour of Good Roads, deserves to be Mayor even of Toronto. I have very much pleasure indeed in asking His Worship Mayor Church, to address you.

ADDRESS.

THOMAS L. CHURCH, ESQ., K.C., MAYOR OF TORONTO.

Mr. Chairman, Your Honour, Ladies and Gentlemen:

On behalf of my colleagues and myself, and the Government of the City of Toronto, I give this Convention a right royal welcome to the City of Toronto. We are glad, indeed, that this Convention is meeting in our city. I generally land any convention I go after, and this was no exception. Toronto has been the centre of the Good Roads movement in the Dominion of Canada. In 1909 the City Council of Toronto took the first step towards the Good Roads movement in Canada. Canada has not kept pace with the importance of this particular question. For many years Canada has been miles behind the times on the question of Good Roads. The railway policy of Canada did a great deal for the people and for the railways that were presented with the roads by the people of Canada, but Canada has not had one copper to spend on Good Roads since Confederation. Prior to the last three or four years, when the question has been taken up by the Dominion Government, the only money the Government of Canada have expended on roads was on an old waggon road across the Rocky Mountains, and the remains of it are still to be seen. It is deplorable to think that Canada has not had one red cent to spend on the King's highway. The advantage of Good Roads to the farming communities and urban communities is very important, because Good Roads bring the consumer and the producer together.

In 1909 the City Council took up the matter of improved highways for a radius of fifteen miles around the city. At that time five out of six of the city papers said I should have my head taken off for advocating expenditure on roads outside the city. This matter was brought to a head and the York Highway Commission was formed, which was the first Highway Commission in Canada. We improved 110 miles of roads for 15 miles around Toronto. Eighty miles of these roads have been put in repair. This year the city has gone into partnership with the Government of Ontario in the construction of the Toronto and Hamilton Road. Our present Lieutenant-Governor has supported us in every way in this matter. I am glad that the Government of Ontario is prepared to give the Province support in the matter of Good Roads. I am glad the Province of Quebec is also taking up the matter, and I am quite sure we will soon have good results. As President of the Union of Canadian Municipalities, I had charge of the Bill that was placed before Parliament by the Dominion Government. The matter of Good Roads has been before the Union for five years and I was their agent in charge of the Bill at Ottawa. The Senate did not approve of that Bill because of some political objections. I am not here to criticize any Government, but I believe the question of Good Roads should be taken out of politics. It is a question that is too big for politics; it affects the very life and social condition of the people and the time has come when this great question should be taken out of politics. If it had not been for party politics, the Senate would have passed the Bill and the Provinces would have had relief. Under the Beveridge Bill, the United States Government have placed the matter in the hands of a Commission and they went over all the States, from Alabama to Texas. This Commission ascertained the area to be covered and the type of

roads to be used, and they proposed, say, that a million dollars should be spent. The result was that Alabama would probably get 2½ per cent. of the whole amount, and so on. The Government of the United States lent the money to the State Legislature. They gave a bond for the amount of money in their hands at 4½ per cent. That bond was deposited in the Federal Treasury and they issued a cheque for the amount and only charged the State 3 per cent. The people of the United States are taking an advance step in this matter. I have the assurance from the Government at Ottawa that when the war is over this matter will be taken up. We cannot expect the Government to advance money at this time.

We are proud to have this Convention at Toronto. I assured your Chairman when I was in Montreal that none of the delegates attending the Convention would be summoned to the police court, as we were in Montreal, for breach of the Automobile By-Law. I can assure you that it will not happen here. We will give you the freedom of the city. I am going to hand the keys of the city to your Chairman and if there is anything you see in Toronto that you want you can take it away with you for the asking. (Applause.) I will guarantee that the police will not interfere with you.

If money were spent on the roads of the Province at this time it would materially relieve the unemployment situation. The construction of the road from Toronto to Hamilton is a credit to all parties concerned. It will link up Toronto with Hamilton, our sister city. One of the bright things about Hamilton is that it furnished the Province of Ontario with a champion football team, the Hamilton Tigers, and it is the place where they grow popular up-to-date Governors.

In conclusion, permit me again to give you a hearty welcome to the City of Toronto. The City Council would be present in a body were it not that they are in session this afternoon, but they will attend the future meetings of the Convention, and if there is anything that we can do to assist the Convention, I hope your President will let us know. I thank you for your patient hearing. (Applause.)

The Chairman: I would be proud to take back to Montreal the keys of the City of Toronto, but we have troubles of our own, and I think we might compromise by asking His Worship to have everything left open except the jail and the police station. (Applause.)

We are honoured this afternoon in having with us Sir Edmund Walker, and I am sure we would all be pleased to hear a few words from him. Good Roads require money and I am sure that Sir Edmund Walker can tell us how to get money and the ways and means to get roads.

ADDRESS.

Sir Edmund Walker.

Mr. President, Your Honour, and Gentlemen:

This is a genuine surprise. I thought I was an onlooker and I was about to slip away to another engagement. I had not the least idea that I was going to be asked to say anything this afternoon. I do wish to emphasize, however, what the Mayor has intimated with reference to the relative importance of roads

as compared with railways and canals. Railways and canals are, of course, the absolute backbone of any new country, but it is just as absolutely necessary to have Good Roads. The one is a complement to the other, and it is astonishing that we have built the railways and canals and not the roads; but we must, of course, have the roads.

I am not going to enter upon the question of finance because that would involve the question of taxation, which I am not going to discuss in the presence of a member of the Government. I believe that in some way or other a country as rich in its potentialities, a country with as intelligent and industrious a people as Canada, a country with as much wealth ahead as Canada, can afford to have Good Roads if similar communities in the United States and elsewhere can have them. One of the first things to consider fairly is, who should pay for the maintenance of these roads, because the Lieutenant-Governor has intimated that maintenance is a great question. I firmly believe that every city and every town should bear a proportion of the cost of the roads for a certain distance beyond its precincts. I believe the people of Toronto should pay for the roads beyond this boundary, because it is the people of Toronto who destroy these roads, and not the country people. We speak of the farmer being unwilling to pay his share. I do not believe he would be unwilling if we were fair enough to sit down and ascertain his share. In New York State their idea is that his share is about 15 per cent. It seems only fair that the Provincial and Dominion Governments should each pay so much towards trunk roads, and that the abutting farmers should pay so much. If we were to ascertain what was fair in that respect we should obliterate a large part of the difficulty of building Good Roads; but as long as the people in the cities complain about the farmers not building good roads suitable for motor traffic, so long we shall keep from having Good Roads. We must recognize the fact that those who use the roads are really those who should pay for them. It is absurd to say that the man who abuts on the highway is the person who makes the most use of the highway. There are fifteen or twenty good plans, but I am not skilled enough to know which is the best. If we can only make up our minds what to do with the abutting owner and the Township, and the County, and the Province and the various Cities, and the Dominion Government, as to the great and small highways in this country, we would in ten or twenty years accomplish what we are looking for. If it took us thirty years to build railroads we should not be discouraged. We would begin to accomplish something in the way of Good Roads when we have made a perfectly square deal as to the cost of building roads and as to the cost of their maintenance.

THE CHAIRMAN: I will now call upon Mr. J. A. Sanderson, the President of the Ontario Good Roads Association to address you.

ADDRESS.

J. A. SANDERSON, ESQ., PRESIDENT OF THE ONTARIO GOOD ROADS ASSOCIATION.

Honourable Sir, Mr. President, Gentlemen:

In the name of the Ontario Good Roads Association I wish to say to our good friends from the American side of the border, and our good friends from Quebec, Manitoba and the other Provinces, that the members of the Ontario Good Roads Association bid you a hearty welcome. It was with a great deal of

pride that the Ontario Association ascertained that the Dominion Association was going to hold its second session at the City of Toronto, the headquarters of the Ontario Good Roads Association. I have no doubt that the members of the Ontario Good Roads Association and the citizens of the Province of Ontario who have taken an active part in the promotion of Good Roads will be benefited by the visits we will receive during this Convention from the other Provinces and the United States. I am sure we will receive valuable information at this Convention, and it gives me a great deal of pleasure to bid you a hearty welcome to the Province of Ontario in the name of the Ontario Good Roads Association. (Applause.)

THE CHAIRMAN: I regret that the Honourable J. A. Tessier, Minister of Roads for the Province of Quebec, has been prevented from being present, but I find that he has a good deputy in the person of Mr. Michaud, who has come all the way from Quebec to attend the Convention, and I am sure, from the paper that he read at the Montreal Convention last year, that we will all be delighted to hear him. He is down for an address to-morrow, but I am sure we would all like to have a few words from him this afternoon as he represents the Honourable Mr. Tessier here to-day.

ADDRESS.

B. MICHAUD, ESQ., DEPUTY MINISTER OF ROADS, QUEBEC.

Mr. Chairman, Your Honour, Ladies and Gentlemen:

First, I must convey to you Mr. Tessier's regrets at not being present to-day. As you know, he is Minister of Roads for the Province of Quebec; he is the second Minister of Roads for that Province. The first Minister was Mr. Caron, who was at the same time Minister of Agriculture and Roads. Since that time a separate Department has been organized and Mr. Tessier has been entrusted with the direction of that Department.

If Your Honour, the Lieutenant-Governor will allow me, I would like to say that your presence with us makes our Convention something a little more than a convention; it is something like a road parliament.

We know the question of Good Roads is a vital one; it is as important as the question of agriculture and even that of national defence. One of Napoleon's great generals—I do not remember his name, there were so many—used to say: "We do not make war with soldiers; we make war with the legs of our soldiers;" that is as true to-day as it was in the days of Napoleon. The big battles are won by the legs of the soldiers walking in the roads, and in that way national defence is connected with Good Roads. One reason why they were able to mobilize so quickly in Europe was because they have Good Roads. Yesterday, in journeying from Montreal to Toronto, I noticed that nearly all your roads leading from the stations were in very good shape. They were well drained gravel roads, and I admired these roads. We have always admired the Province of Ontario on account of its marvellous development; from every point of view we admired the Province of Ontario, but we were not jealous of Ontario. A few years back, we were on the verge of becoming jealous of Ontario as regards your roads, and we woke up, and we built up a system for improving our roads and it has already

given evidence of its utility. Last year a number of people of this Province came to Montreal—among them Mr. McLean, and they had an opportunity of seeing our King Edward Highway which we began to build in 1912 and which was completed in two years. We have done much in the few years that we have been working on our Good Roads system, but I am not here to brag of the work of the Province of Quebec. The best I can do this afternoon is to thank His Honour for the very cordial welcome he has given us and for his presence amongst us. (Applause.)

THE CHAIRMAN: I find the very pleasant duty devolves upon me of thanking His Honour, the Lieutenant-Governor, for honouring us with his presence here this afternoon, and His Worship, the Mayor of Toronto, the Hon. Finlay Macdiarmid, Minister of Public Works of Ontario, and the other speakers for the warm welcome they have given us. I am sure that I shall be very proud to take back to Montreal the key of the City of Toronto. It must be a wonderful key that opens such a wonderful city as you have here. On behalf of the Convention, I wish to repeat that I tender our sincere thanks and our appreciation for the kind words of welcome that we have received.

I hope this, our Second Convention, will be greater than the one we held last year, and that the Convention we will hold next year will be better still. I am very enthusiastic on this question of Good Roads. I go so far as to say that it is a real question of civilization. Last year we took our delegates over the King Edward Highway, of which we in Quebec are rather proud. It is a link between the United States and Canada, and the Province of Quebec constructed 47 miles of it, making 84 miles of beautiful road which connects us up with New York State and all points in New England. In taking the delegates over that road last year, I could not help but remember that four years before, when I passed over it on my first automobile drive to Plattsburg, it was thought to be quite a bold undertaking to motor the 84 miles to Plattsburg when I owned my first automobile 17 years ago, and I have seen all features of the automobile industry. It took me from nine in the morning to about five in the afternoon to motor those 84 miles. Now we can travel that distance in — I won't say what time; it might be indiscreet. However, four years ago the road was in such a condition that the people seemed to neglect their fences and their houses were not painted, but what a difference now! The schools are kept in good shape, the children are better dressed, the little girls wear new dresses and all the children wear boots, whereas before they thought it was almost a luxury to wear boots with such roads. It was considered easier to clean their feet than their boots, and therefore, they went barefooted to school. Last year we noticed that they had flowers on their lawns and that they had real lawns on which they used lawn mowers and kept the grass nicely cut, and on Sundays hundreds of automobiles pass along this road. I think I am right in saying that Good Roads bring civilization to a country.

During war is the time to prepare for peace, and peace means Good Roads. When we raised the Home Guard in Montreal the automobilists were proud to offer their cars for the use of the Home Guard, but how far could we take the Home Guard in our automobiles if we did not have Good Roads? Would we ever reach the boundary line quickly enough? Therefore, the question of Good Roads is important even in war time. I feel that with the moral support

of such men as your Lieutenant-Governor, and His Worship, and the Honourable the Minister of Public Works, that we could make bold to continue our good work and to feel that this question of Good Roads has come to stay with us. Once we get interested in Good Roads, we can never stop even if we want to, because it is so fascinating.

Once again, I desire to thank you sincerely on behalf of the Convention for the kind welcome you have given us. I am sure that our stay in the City of Toronto will be a very pleasant one indeed. When I arrived last night and found my good friend, Mr. McLean, was prevented from attending the Convention through illness, it was a severe blow to me. I know all of you will regret it very much, because he is such a sincere worker in this matter of Good Roads. It was partly due to his good offices that our Convention was such a success last year. He stayed with us the whole week and the benefit of his experience and knowledge helped to make the Convention a success.

I am going to ask our Secretary to read a letter we have received from Mr. McLean which speaks for itself.

The following letter was then read by the Secretary, Mr. George A. McNamee.

"Dear Mr. McNamee,—With regret I am compelled to inform you that owing to illness it will be impossible for me to be present at the Road Convention. To thus forego the pleasure of presiding at what will, I confidently believe, be the most influential road gathering yet held in Canada, is, I assure you, a severe disappointment.

"The promised attendance at this Convention of many public-spirited citizens, of influential delegates from local municipalities, of representatives and officials from Canadian and American Governments, of eminent technical authorities on road construction and control, is all eloquent of the place which Good Roads hold in the public thought of to-day. The excellent programme arranged, together with the exhibition of materials and machinery, are an evidence of the efforts yourself and the committee have personally made to present the subject as fully as possible.

"The first duty of every British subject to-day is toward the war, the care of those who have been its unfortunate victims, and the complete success of the allies. But it is a poor rule that will not work both ways. 'In time of peace, prepare for war' may therefore be reversed into the rule, 'In time of war, prepare for peace.' I know of no step which can be more fittingly taken in the preparation for peace than to devise means and organization for the improvement of the roads of Canada.

"Citizens of countries which have Good Roads regard them as a necessity, not as a luxury; and they consider that only very wealthy countries, prodigal of their resources, can afford the loss arising from bad roads. The way from the farm to the city has become very easy and attractive for young men. Good roads will make it easier, more attractive and more profitable for them to return. From social and economic standpoints, the advantages of Good Roads are such that an efficient and reasonable organization for construction and maintenance has become the concern of all progressive Governments.

"Please assure the Congress that I feel it a very great personal loss to be thus unable to meet them and join in their proceedings; and convey to them my kindest wishes for a successful conference and exhibition.

"Sincerely yours,

"W. A. McLean."

THE CHAIRMAN: I am sure we will all feel that it is a great loss to be deprived of Mr. McLean's experience and goodwill and knowledge, and I would ask Mr. Hezzelwood to move a vote of regret.

MR. O. HEZZELWOOD: Your Honour, Mr. President and Gentlemen: One can scarcely say that it is a pleasure to move a motion of regret, but I certainly feel honoured at being asked to do so. I have been associated with Mr. McLean for several years in connection with the Good Roads movement and I have always found him so patient, so indulgent, so gentlemanly, but, above all, so practical

and so well posted. My association with him was brought about by my connection with the Automobile Society and it was pleasant to find that he was so fair-minded. Sir Edmund Walker said here this afternoon that there should be a careful weighing of responsibility and that each one should be prepared to bear his part. Mr. McLean was fair-minded because he found that the automobilists were fair-minded. Once in a while you will find someone who objects to the fees the automobilists have to pay, but it never comes from the man who has been using an automobile for some years. I am pleased to be asked to move this motion and with your permission I am going to add to the motion that the letter that has just been read be received and inscribed upon our minutes. Mr. McLean has made some very splendid statements in that letter and I hope it will receive due publicity. I know of no single person who would add so much or bring so much valuable experience to the sessions of the Convention as Mr. McLean, and we regret his absence and hope for his speedy recovery. I will therefore move that the sympathy of this Convention be extended to Mr. McLean with our regret at his absence and our sincere hope for his speedy recovery.

THE CHAIRMAN: I have pleasure in calling upon Mr. Arthur Hewlett, the Vice-President of the Board of Trade to second the motion.

MR. ARTHUR HEWLETT: Your Honour, Mr. President and Gentlemen: I consider it a great honour indeed to have the privilege of seconding this motion. The Toronto Board of Trade stands for everything that is for the welfare of the City of Toronto. I was much impressed with the part of Mr. McLean's letter which refers to this question from an economic standpoint. We have only to consider what it costs the farmers in horses and wagons and what it costs some of us in gasolene to get over some of the roads that we sometimes have to travel.

I am sure we all regret Mr. McLean's absence and I have great pleasure in seconding the motion of sympathy and regret.

Motion put to the meeting and carried unanimously.

MR. THOMAS ADAMS: Speaking on behalf of the Commission of Conservation of the Dominion Government, I would like heartily to endorse the resolution that has been submitted to the meeting. I have been associated with Mr. McLean a great deal in connection with the Good Roads movement, particularly in the specific case of the new road which is being constructed between Hamilton and Toronto. I would like to say from the point of view of the planning of roads, as well as the construction of roads, that Mr. McLean is not only an engineer of great capacity and knowledge, but a man of very broad views and high capacity as an advisor of the Government, and I appreciate the great service Mr. McLean has rendered to this movement in Canada. (Applause.)

Exhibition of Paving Materials.

SECOND SESSION

Tuesday Morning, March 23rd, 1915

J. A. Sanderson, Esq., Vice-President, in the Chair.

The Chairman: The first item on the programme is the appointing of Committees for the Ontario Good Roads Association. I will appoint the following Committees:

Nominating Committee.

W. H. Pugsley, Esq., York County, Ont.
T. L. Kennedy, Esq., Dixie, Ont.
C. R. Wheelock, Esq., Dufferin County, Ont.
Geo. S. Henry, Esq., M.P.P., Todmorden, Ont.
J. J. Parsons, Esq., Haldimand County, Ont.

According to the constitution of the Good Roads Association, the meeting at large has the right to appoint five in addition to those nominated by the Executive. The following are nominated from the floor of the House:

David Dempster, Esq., Leeds County, Ont.
Geo. Hamilton, Esq., Stratford, Ont.
M. Marion, Esq., Russell County, Ont.
N. S. Cornell, Esq., Belleville, Ont.
J. Douglas, Esq., Wentworth County, Ont.

Committee agreed to.

Resolutions Committee.

S. L. Squire, Esq., Waterford, Ont.
K. W. McKay, Esq., St. Thomas, Ont.
F. A. Senecal, Esq., Prescott County, Ont.
T. E. Allen, Esq., Hastings County, Ont.
N. Vermilyea, Esq., Belleville, Ont.
R. H. Lush, Esq., Peel County, Ont.

The Chairman: I am sure we are all pleased to have with us this morning Mr. Geo. C. Diehl, Engineer of Erie County, in the State of New York. Mr. Diehl has come over from New York State to address us at this Convention and I have no doubt we will receive a great deal of knowledge from his address. I have had the pleasure of hearing him before and I know that he will give us a very interesting and instructive address.

"ROAD CONSTRUCTION IN NEW YORK STATE."

GEO. C. DIEHL, ESQ., ENGINEER OF ERIE COUNTY, N.Y.

Mr. President and Members of the Good Roads Association:

I want to say that your President is a very brave man, having heard me before and having nerve enough to hear me again. It is always pleasant for a New Yorker to come over to Canada and especially to Toronto.

It is with a great deal of regret that we miss our good friend Mr. McLean, and we sincerely sympathize with him in his illness and we hope he will make a very rapid recovery. He is known throughout the length and breadth of the United States as one of the foremost Highway Engineers, one of the most enthusiastic and energetic in this matter of Good Roads that is to be found anywhere. As you all know, he was elected and served as President in one of our great road associations, the Road Builders' Association of America.

I do not know that there is much I can say about the New York State situation in the limited time at my disposal, but I do want to say that the people in the State of New York are vitally interested in the road improvements in the Dominion of Canada. The reason they are so interested is largely the natural development of the road situation in the State of New York. About twenty-five years ago, all of the work in the State of New York was done under the so-called Labour System, and there were some 2,000 or 3,000 pathmasters' districts. After working along that system for 100 years, the roads were not much better than when they started. Later they enlarged the unit, so that the township became the unit, instead of the pathmasters' district. At that time the average good citizen was satisfied if there were four or five miles of good road in his vicinity, and he was eminently satisfied if the roads in his township were improved. Later on the people realized that it was important to have the roads improved in the adjoining township and counties. They realized that it was the fundamental principle of taxation that payment should be made according to benefits, and that if the cities of the State benefited by the roads, they should share in the expense of building the roads. It was on that theory that the State enacted State Aid legislation, and to-day, the people in the States of New York, Massachusetts, and Connecticut, realize that they had not done their duty when they fixed the roads in their own State, but that it is up to them to assist in building the roads in other States, possibly through some form of federal co-operation. It is along that line of thinking that the people in the State of New York not only want the roads improved in Pennsylvania and Ohio, but they equally want the roads improved in the Dominion of Canada. The people in the City of Buffalo particularly are anxious to drive their automobiles and spend their money in the Province of Ontario, and they are anxious for the people here to come over and spend their money in New York State.

With a proper system of highway construction, you will find the motorists coming over the river at Ogdensburg and going to Ottawa, and at Niagara and going to Windsor and Detroit, the great home of the automobile. I do not want to give an automobile talk this morning, but I want to bring out these few points, that last year in the State of New York there were 150,000 visiting motorists. They have spent an average of $50 each, which means that they left seven and a half millions of dollars in the State of New York. That is just an example of what would happen in the Dominion of Canada if your roads were improved, to say nothing at all about the great commercial, social, moral and religious advantages which come from a proper system of roads.

I would like, briefly, to refer to what has been done in the State of New York. In 1898 the first State Aid Law was enacted, and that provided that the main highways of the State should be built in the following manner: that the State should pay 50 per cent., the county 35 per cent., and the township 15 per cent., and that the roads thereafter should be maintained by the locality. They provided for the main roads, which were about one-tenth of the total, or 8,000 miles out of a total of 80,000. The balance of the roads were to be maintained by the township. The State contributed 25 cents to the township for each dollar that the township raised. They worked under that plan from 1898 to 1905 and during that time the State provided something over $3,000,000. In 1905 the people voted in favour of a bond issue of $50,000,000 and in 1912 they voted in favour of another bond issue of $50,000,000, making $100,000,000 in all. The plan was changed in 1899 and the roads were divided into three classes, namely, State highways, County highways, and Township highways. State highways were paid for entirely by the State, and comprised about 4,000 miles. They were the main trunk lines which connected the larger centres of population throughout the State and connected the various county seats. The second class comprised the County highways, the main market roads of the different counties, the roads which would form a proper connection and develop a system of highways for the purpose of common traffic. The third class of highways was the Township highways. The Township highways were maintained under the supervision of the State Highway Commission and the State contributed practically one-third of the cost. That is practically the system that is in operation in New York State to-day.

With regard to financing the system, the State has voted in favour of contributing $100,000,000 of which $75,000,000 has been contracted or expended. That money is applied solely to State and County highways. For the Township highways, the Township raises about $6,000,000 and the State contributes towards that $1,800,000 a year, making some $7,800,000, which is available for Township highways. In addition to that, the law was amended, so that the maintenance of the roads was done by the State Highway Commission at the expense of the State, with the exception of $50.00 per mile, which was paid by the township in which the highway was situated. This year the State has appropriated about $4,000,000 for maintenance, so you will see that this, together with the $8,000,000 and $10,000,000 which was annually appropriated for construction, means that the State of New York has expended upwards of $20,000,000 a year for the improvement and maintenance of these highways. About 95 per cent. of the assessed valuation of the State is situated in the cities or incorporated villages, so that 95 per cent. of that amount is raised by the cities and incorporated villages of the State. Incidentally, the great City of New York pays nearly 80 per cent. of the total. The State of New York has an assessed valuation of $7,000,000,00. They practically pay 7/8 of the entire cost. The administration of the Highway Department at the present time is in the hands of the State Highway Commission. The State Highway Commission is appointed by the Governor, and serves practically at the Governor's pleasure, although the law says for five years. Under the Commissioner there are three deputies, one deputy is in charge of maintenance, one in charge of construction, and one in charge of the common highways. Under these deputies are nine divisional engineers. The State is divided into nine sections, and each one of these sections spends about $2,000,000 annually. Under these superintendents are assistant engineers and others.

One of the great objections to the State system has been the lack of permanency in office. Since 1898 (that is, a period of seventeen years) there have been twelve heads of the Highway Department, on the average one in less than a year and a half. All of these gentlemen are cultured and honoured members of the community, but most of them have not been road-builders, and by the time they get sufficiently familiar with their duties, they are legislated out of office, and that has probably been the cause of the greatest waste in the highways of the State of New York.

The State and County Highways comprise about 12,000 miles. Of that mileage, about 6,500 miles have either been completed, or are now under contract. Under the common highways there have been about 3,500 miles of macadam roads built, so that there are about 10,000 miles of improved State, County, and Township highways improved with macadam or a more expensive form of construction. About 5,000 miles have been improved as gravel roads, making a total of 15,000 miles that have been improved out of 80,000. This shows that there are still some 65,000 miles awaiting improvement. Of the $100,000,000 appropriated for main highways, $75,000,000 has been expended, and in about three years the construction period will cease and they will have all the main highways of the State improved. At that time the proposition will become one of maintenance, and following the same course of procedure that they do in railroading, they will get down to the maintenance period, and then the work must be more highly systematized than ever before.

Now in regard to the type of construction, of course, if one piece of road is not properly constructed, the people will say the entire $100,000,000 has been wasted. That reminds me of the story of a man who said he could tell the religion of a man who owned an automobile, and his friend asked him to show him how it was done. A man came along in a big Pierce-Arrow car and he said, "That man is an Episcopalian." After a while another man came along in a Packard and he said, "That man is a Presbyterian." Then along came a fellow in a little Ford and he said, "That fellow is a Christian Scientist, as he only thinks he has a car." That is the state of some people in New York; they only think they have new roads.

They have adopted about fifteen different standard types of pavement in the State of New York. They can be divided under four heads, the brick pavements, the concrete, the bituminous pavements and the waterbound macadam pavements. The waterbound macadam pavements can be divided as follows. First there is the straight waterbound macadam with broken stone, usually a five inch bottom course with a three inch top course, that is, after being rolled. That is varied in some instances by placing underneath that eight inches a Telford base of flat stone, and it is also varied by putting in a sub-base of field stone of uniform size, and the third variation is where a sub-base is used for the bottom course and the top course put on top of that.

Then there are the concrete roads, which are in two classes, one a concrete mixture of one and three, following plans of the roads which have been built in Toronto, and with which you are familiar. The other type of concrete road is what is known as the compressed concrete road, in which the stone is compressed before the sand and cement and water are added.

The bituminous roads are generally known under four or five classifications. First is the bituminous road constructed by the penetration method, whereby the bitumen is applied practically the same as water on macadam, the top course being

of broken stone which is rolled. The bituminous material is added by what is known as the penetration method, by pressure passing over the road and depositing a gallon and a half to a gallon and three-quarters of bituminous material in between the stone. This is afterwards covered with cement. The other type is obtained by means of the mixing method, and this is specially divided into two kinds, one in which the stones used are practically the same size as are used in the penetration method, the stone and the bituminous material being heated and mixed and then deposited on the roads. The other class is where none of the stone is over a half inch in size and the whole is heated and mixed with the bituminous material. Another form is the Bithulitic pavement, somewhat similar to the second mixed form which I have very briefly outlined. There are also various forms of cheap asphalt pavement.

The next class consists of the block pavements—first the brick pavements which are usually placed on about five inches of concrete base, sometimes a somewhat heavier base; then the stone block, the wooden block and the asphalt block pavements. The stone block pavement is usually only used on the hills, and sometimes through the cities and incorporated villages. Generally speaking, the asphalt block and wooden block pavements are only used in cities and incorporated villages, although the wooden block is quite frequently used in bridge work. The brick pavements are generally used in the vicinity of the larger centres of population where there is a very excessive and heavy combined traffic. It has been found that where the travel is primarily automobile the bituminous pavement will generally carry the traffic satisfactorily, but where there is a mixed traffic, with heavy trucks and horse-drawn travel, it is customary in the vicinity of large cities to build a brick pavement.

The concrete pavement is usually made where the travel is not quite so heavy and where there is a suitable sub-soil, such as gravel or sand, to take care of the drainage fairly well without artificial means. Bituminous pavements are usually placed where there is a predominance of automobile travel and where the horse-drawn travel is not too heavy. Waterbound macadam pavements are placed on the remaining main highways. The concrete pavements and the waterbound macadam pavements are largely placed on the outlying roads with the view that, as the traffic increases (and the traffic always does increase when new roads are built—we have roads over there, where the traffic is fifty times as much as it was before the highway was improved) as the traffic increases, these macadam pavements and concrete pavements can be used as the foundation upon which to lay one of the block pavements or other more expensive and durable type of pavements. Throughout the States about 6,500 miles have been built, about 300 miles being brick pavements and about 600 miles concrete, about 1,600 miles bituminous pavements and about 150 miles miscellaneous pavements (stone. Bithulitic and other types) and the balance have been waterbound macadam.

Repairs are practically all done on the macadam and bituminous pavements through surface applications, and it is customary to apply these at about 1/6 to 1/2 gallons per square yard. The lighter oils are used without covering, and the heavier oils are covered with screened gravel. The improvement of the brick pavements is made merely by replacing the damaged material with good material.

The bituminous material used in the State of New York can generally be graded under two heads, that is, the bituminous material of asphalt and the bituminous material of tars. The asphalt is used in several different specifications, one form of specification for the penetration method, and one form for each of the two

mixing methods which have been described; then for the surface specification a material known as H.O. (hot oil) and C.O. (oil applied cold). The tars are specially divided into high and low carbon tars, and each one of these further sub-divided for hot treatment and cold treatment.

That, very briefly stated, is the situation in New York State. I do not know that it is particularly interesting to you, except in so far as you can profit by the experience of New York and several other places. One of the ways in which you can profit is by making a larger appropriation for road purposes. At the rate you are now going in Ontario, although it is very commendable, it will be many years before you finish your main system of highways. You are not doing nearly so well in Ontario as they are in Quebec. They are making a much larger appropriation in Quebec.

I think the proposition of the State of New York of issuing bonds for Good Roads might well commend itself to your attention. There they issued bonds for $100,000,000 and they are building the roads now and the present generation are using them, and they are not waiting for a new generation before the system is completed. The present generation is profiting from this system of highways. It helps the city man and the farmer, and the property is increased in value. The cost for transportation is reduced. Hundreds of thousands of fast automobiles are passing through the State and leaving their money there. Instead of waiting for a small annual appropriation and having the system delayed for forty or fifty years, they are going ahead with the work and getting the benefit of the roads. The objection has been raised that we should not bond for roads. The bonds of New York States are from 30 to 50 years; the first bonds were sold at four per cent., and the bonds now being issued are for four and one-half per cent. It has been said that the roads will wear out before the bonds mature. To cover the situation very briefly, roads, generally speaking, consist of three parts. The first part is the grading, widening, cutting down steep hills, and the drainage. That costs about one-third of the total. You can readily see that when that is once done, it is done forever. If you cut down a steep hill or widen a road it will last forever. The next is the construction of the bottom or foundation. If this foundation is properly constructed, it will outlive several bond issues. That costs about one-third of the total, therefore you have two-thirds of the entire road practically permanent. That brings us to the last part of the road, the wearing surface, which will cost about one-third and wears out from year to year. That is renewed in the State of New York through annual appropriations. The money for renewing that top surface is paid for, not out of bond issues, but from annual appropriations. Therefore the roads are always kept up to the standard, and at the end of each year and at the end of the bond issue, if the work has been properly done, the road will be just as good as it was at the beginning.

The wearing surface is a subject that is to be treated by Mr. Tillson, and that is one of the most important subjects of the whole, Road Construction, because one-third of the cost practically depends upon the proper selection and proper care of the wearing surface. I am safe in saying that there is not a man in the United States who can treat that subject better than Mr. Tillson. The Road Builders' Association has chosen him as successor to Mr. McLean, and that Association is getting on a high plane by selecting its officers from the most famous engineers in Canada and the United States.

I think Ontario and Quebec would gain by adopting the bond issue. Another point in which I think you would gain would be in making the cities pay their

share of the costs. Over with us the cities are part of the county organization and they pay their share. If I understand correctly, the City of Toronto is not part of the county. The City of Buffalo has contributed several million dollars towards the highway construction in the county and it is eminently fit and proper that it should, because the city benefits from cheap transportation. I think it an extremely short-sighted policy that exempts from taxation the larger taxable assets of a city like Toronto that benefits from Good Roads. I do not know enough about your Dominion Law to say just how that should be done, but I say that the cities benefit largely from the construction of roads and they should bear their share of the taxation. I think you will profit from the experience of New York, and you will find it is a great mistake to change the head of your Highway Department. In seventeen years we have had twelve different heads.

Regarding maintenance, this is paid for by the State and not by the locality. One word before I sit down in regard to the smallest unit of highway taxation, the township. It is a fact that about ten or twelve years ago, the unit was enlarged from the pathmaster system to the township. My opinion is that the unit should be enlarged again from the township to the county. I am inclined to think that a great deal of money is wasted by township organization. There are many good road builders in the townships, but many of them are selected by reason of politics, and I believe the work should be conducted by the counties.

I am not going to take time to elaborate on that point, because I think I have taken up too much of your time. The people from across the line are interested in the highway movement in the Dominion. You are our neighbours and we are interested in you. We take a great deal of pleasure in your success and you have our utmost sympathy in your troubles. We sincerely hope that the road movement in the Dominion, especially in Ontario, will progress, and that you will build throughout this Dominion a system of roads second to none in the world, and that you will attract to this country people from all over the world, and that as we become better acquainted, we will become better friends and work together for better highways throughout this continent. (Applause.)

MR. BEAM: How do your concrete roads compare in durability with macadam? I mean, for country roads.

MR. DIEHL: The best type of concrete roads that I know of are in the neighbourhood of Detroit. If a concrete road is properly built it ought to give really good results. Just where a macadam road should be built in place of a concrete, depends very largely on the condition. One problem that enters into it, is how much money you have got to spend. Another problem is a traffic problem—how many vehicles are going to pass over the road, and what kind of vehicles—and there is the problem of soil conditions. The experience of New York State might be a fair index. Out of 6,500 miles of road, 300 have been brick, 600 concrete, 1,600 bituminous and 4,000 miles macadam. There is no kind of road that is going to answer for every mile.

I think it is a great mistake to make disconnected sections. That is one reason why I think we should enlarge the unit of highway taxation, namely, the county instead of the township, because the township man wants to build a little bit of road in front of some influential man's farm. The result is that you have two miles of good road here, and then two miles of bad road, and that does not help the traffic. There is a good deal of bunkum handed out to the farmer about building roads from the farm to the market. What you should do is to commence at the market and build out to the farm. Never build a disconnected

piece of highway. I am pleased to state that in Erie County, of the 300 miles of road we built, every single mile is connected with the City of Buffalo and every single mile connects with the other, and when the farmer hits that road he knows the way is clear to the market. Very frequently he puts on an extra horse to get to that road, but when he gets there he knows the road is good all the way. I do not think it makes for economy to have disconnected pieces.

MR. E. W. STERN: Has Mr. Diehl any figures as to the cost of maintenance of the New York State highways that have a bituminous surface?

MR. DIEHL: The records have not been kept, and the reason they have not been kept is that every year and a half they have a new commissioner. I firmly believe that track should be kept of each road, the tonnage that goes over it and how much it costs to keep it in repair, and then you would have the cost of so much per ton of travel to keep that road in repair. The best records of that have been kept in England. In the State of New York it has been costing about $800 to $1,000 a mile for maintenance, and it has been costing about that same amount in the State of Massachusetts. That includes not only the cost of maintenance, but what we know as the cost of reconstruction. As a matter of fact, when we started this road movement seventeen years ago, a road that had two hundred vehicles a day was quite a road. Now we have roads that carry 10,000 vehicles a day, and the proposition has so increased that some roads have to be entirely rebuilt, and the reconstruction cost is in this case $1,000 a mile. Roughly speaking, a bituminous road requires about a gallon of material and a cord of gravel or stone, which will cost about $300 or $400 a mile, and if you say that the cost in New York State of maintenance is about $300 or $500 a mile on these main thoroughfares, that would be a fair estimate, the other $500 a mile covering reconstruction. You must always keep in mind the amount of traffic. It is rather a misnomer to say a road costs so much a mile to maintain. You should say it costs so much per ton, because if one road carries a hundred tons and another road carries a million tons, one has ten times as much use as the other. We must get away from this cost per mile. It should be cost per ton, and when we get proper traffic statistics we can determine the best kind of road to select, and until you do that, I think what I said to Mr. Beam is fairly good advice: "Don't put your eggs all in one basket."

MR. E. W. STERN: One more question, and that is, as to the length of the bond issue. Not only has the wearing surface disappeared, but the foundation has also disappeared, with the result that the roads have had to be renewed, and as we have fifty year bonds and a ten year road surface, it is a very serious matter. Many of us believe that the bond issue should be very much shorter. The future generations should not be taxed for the mistakes of the present.

MR. DIEHL: You must remember that these roads have got to be reconstructed out of bond issues. They have been reconstructed out of the maintenance fund, and the maintenance has never exceeded $1,000 a mile. The work that the bond issue has paid for has always been kept intact through annual appropriations. In spite of the fact there has been more or less talk about the condition of the highways in the State of New York, it is a fact that the roads in the State of New York are equal to any in the United States. We have a mileage in the State sufficient to reach from New York to San Francisco, and from Quebec to Florida, and enough left over to duplicate the area in any other three States. I have driven an automobile from Buffalo up into the northern woods in the fall of the year, after we had had five days' continuous rain, at an average of 25 miles an hour,

without injuring my car. The roads of New York State are a credit to the State and an advantage to the State, and I hope every one of you will have a chance to go over some of them.

THE CHAIRMAN: We have all been very much pleased with the address of Mr. Diehl. I am sure we appreciate his visit from the United States. We are now going to have an address from the President of the American Road Builders' Association, Mr. Geo. W. Tillson, of Brooklyn, New York, and we are pleased to have him with us.

It was my pleasure to attend the meeting of the American Road Builders' Association at Chicago in the month of September, and I can assure you that they did things in a pretty nice way, and we appreciate the fact that their President is with us at this time, and is going to discuss our troubles. Coming as he does from the Association, of which our good friend, Mr. McLean, was the former President, I am certainly pleased to introduce Mr. Tillson this morning.

"WEARING SURFACES."

GEO. W. TILLSON, ESQ., CONSULTING ENGINEER TO BOROUGH OF BROOKLYN, N.Y.

Mr. President and Gentlemen:

I certainly wish to reiterate everything Mr. Diehl said in his opening address, both as to the pleasure of coming over to visit you people in Canada, and also regretting that Mr. McLean is not able to be with us. Without detracting anything from the pleasure I have in meeting the people here whom I have never met before, I must say that the greater part of the pleasure I anticipated is gone on account of not being able to meet with Mr. McLean. It is always a pleasure to attend these associations and see what is being done by the different engineers in different parts of the country. If we stayed at home, we should get down into a rut. No man can go around to these different associations and hear the ideas expressed by the different people and see the work that is being done by the different engineers, without gaining a great deal of knowledge. I think I have learned more about the subject of pavements and roads by going around and viewing the different pavements that have been laid by other people, and by hearing the ideas expressed at different associations, than in any other way. The subject that has been assigned me has been necessarily treated a little by the previous speaker in his talk about New York roads, because the wearing surfaces of all roads are involved in what he says.

The question of improved roads first became important when transportation of commodities and passengers by wheeled vehicles came into vogue. This was in comparatively recent times as the world's history goes, for as late as one hundred years after the reign of Queen Elizabeth regular pack trains for the transportation of goods were operated in England, and even at that time wheeled vehicles for passengers were very little used. Writers tell us that in the seventeenth century the nobles, in travelling from their homes to London in private carriages, were often robbed by highwaymen, so frequently indeed that a highwayman, when convicted, was punished with death. It is also stated that the bad condition of the roads aided the highwayman very materially in making their hold-ups.

Ever since that time there has been much discussion regarding road construction, but it was not until 1764, when Mr. Tresaguet, in France, began to build broken stone roads of somewhat the same character as are now well known in America by the name of macadam, that much improvement was noted; and it was about sixty years after this that systematic road-building was begun in England, under the direction of Telford and Macadam, from which latter name has come the term in general use of macadam broken stone roads. It would seem too, that road construction in those days received more attention than pavement construction in cities, as it is stated that an English engineer, in 1826, publicly remarked that however true it may be that an observant traveller cannot fail of being struck with admiration at the excellence of the turnpikes and other roads throughout this country, he must at the same time be very much surprised at the badness of the carriage pavements, even of the principal streets of the metropolis."

The importance of road building in this country has been known for many years, but it did not receive much attention until about 1895, when the advent of the bicycle and its great popularity for a time made necessary the construction of improved roads if the bicycle were to be used to its best advantage. When the use of the bicycle began to wane, the development of the automobile caused the subject to be taken up anew, and with increased vigour. The people using the automobile were much more influential and wealthy than those using the bicycle, and the result has been that a wonderful Good Roads movement has been extended all over the country. It has grown to such an extent that in the State of New York alone during the last six or eight years issues of bonds to the amount of $100,000,000 have been authorized, and the greater part of this amount has been spent up to date.

Mr. J. C. Pennybacker, Chief of Road Economics, United States Office of Public Roads, in an article in the "Engineering Record" of January 3, 1915, states that 16,000 miles of surfaced roads were constructed in the United States during 1913, and 18,000 miles during 1914, or a total of 34,000 miles in the brief period of two years. He estimates that the total outlay for 1914 for Good Roads will be $225,000,000, while in 1904 the total expenditure in all States slightly exceeded $79,000,000. This $225,000,000 represents an expenditure of $2.25 per capita for the entire United States, being about $20,000,000 for New York State alone for one year. These figures are enormous, and one has to wonder if the work can be kept up, and also if, with this enormous amount of road building, sufficient provision, both in organization and in money, will be provided for proper maintenance.

1. *Earth Roads.*—The cheapest form of road, of course, is the ordinary graded road, without any attempt to surface with any foreign material. Although this cannot be considered an improved road, still with proper attention to it results can be obtained that seem remarkable when compared with an earth road that receives no care at all. By the use of road drags and a little attention during bad weather, earth roads can be kept in fairly good condition for ordinary traffic.

2. *Sand-Clay Roads.*—These roads are made either by the application of clay to the ordinary sand surface or the application of sand to a clay surface, according to the original condition of the road to be improved. In proportioning sand and clay in this method of construction, it must be understood that the clay acts practically as does cement in cement mortar, and consequently an amount of clay sufficient to fill the voids only should be used. This is more important

than in the case of mortar, because if too large an amount of clay is used it will allow the particles of sand to move too freely, while if the amount is too small the particles of sand will not be bound together. It must be understood too in this general treatment, that the quantity of sand to be used depends upon the character of both the sand and clay, (a clean, sharp sand requiring more clay than one which has a certain amount of loam) and, too, the quality of the clay is an important factor, whether it is pure or whether it has an admixture of sand. When a clay road is to be treated, the surface should be brought approximately to the form that is desired and loosened up, when the sand should be spread over the surface in sufficient quantities and thoroughly mixed. The surface should then be smoothed off and compacted with a light roller or road drag. When the original soil is sand, the road is levelled off and the clay spread upon it to the required width and thoroughly mixed with the sand, when the roadbed is shaped up, and, if necessary, more sand applied. The surface is then smoothed and compacted as for the clay sub-soil.

3. *Gravel Roads.*—Very satisfactory and fairly durable roads can be made with gravel, the exact method of construction depending upon the quality of the gravel itself, but, in the main, it is spread over the road to such a depth as to give proper thickness when completed, and then rolled until it becomes hard and firm. Whether it will require any filling or binding in order to make the surface hard and compact depends upon the quality of the gravel. It can be said, however, that the softer the gravel, the more easily it will be compacted, but, for the same reason, it is less durable under traffic. These roads are often used in parks, and even on State roads where the traffic is light and where a permanent material is expensive. It is difficult to give an estimate of their cost, as this depends entirely upon the distances the gravel must be brought and its first cost. An estimate of 50 or 60 cents per square yard would probably be not far from correct for a gravel road 6 inches deep.

4. *Waterbound Macadam.*—This is the well known broken stone road surface, which is made up of different layers of broken stone, the surface layer being about 3 inches thick and formed of stone that will pass through a 2-inch ring, the character of the stone depending a great deal, as in gravel, upon its binding easily. As a rule, limestones are of such a character that sometimes no rolling is required to obtain a smooth and hard surface, while trap rock, on the contrary, must have the interstices filled with fine material in order to get the stone sufficiently bound together. Waterbound macadam was laid in New York State in 1914 at a cost of 30 to 40 cents per square yard for a wearing surface 3 inches thick.

5. *Bituminous Roads.*—When the automobile with its pneumatic tires came into use, it was found that it presented an entirely different problem from the old horse-drawn vehicle with its steel tires. The former caused the macadam to disintegrate and ravel, while the latter had a tendency to compact it in a manner somewhat similar to steam rollers. This fact was recognized first in Europe, because the automobile was used there to a considerable extent previous to its use in America, and different methods of treatment were instituted to overcome the bad effect. The first method was to spray the surface with tar, and after many experiments, schemes were worked out that were fairly satisfactory. This method has been employed to quite an extent in America, but, with surface treatments, asphaltic oils are generally used, as they are cheaper and, some engineers think, better. The volatile parts of these oils evaporate upon exposure, leaving an

asphaltic carpet over the surface which is much like an asphalt in its general appearance.

In Brooklyn, New York, nearly all of the park roads are of gravel, and a great portion of them have been treated as follows: Heavy asphaltic oil is spread on the surface at the rate of 7/10 of a gallon per square yard; the ruts and holes in the road are all repaired previous to the application of the oil. The oil is applied by gravity distributors, it being taken from tank cars, which are heated to a temperature of about 200 degrees F. before being unloaded. The oil is maintained in the distributor at this temperature and applied to the roadway surface. After the oil has been applied a coating of coarse sand is spread at such a rate that one square yard of sand covers 53 square yards of surface. The roadway is closed to traffic for twenty-four hours after the spreading of the sand. This process has been in use for two or three years and has given good results. It must be remembered, of course, that on the park roads no heavy vehicles are allowed, and it is undoubtedly true that with heavy steel-tired vehicles this treatment would not be satisfactory. Some trouble, even with the automobile traffic, occurs in the shape of creeping and bunching of the surface, but the bunches are cut out and easily repaired. The cost of the asphaltic oil delivered in cars is 6 cents per gallon; the cost of sand alongside the road, $1.35 per cubic yard; and the cost of the complete treatment, including labour and materials, but not including overhead charges, has averaged 8 cents per square yard for three years.

Another method of building bituminous roads is what is known as the penetration method, when, after the stone is spread upon the road, the upper surface is sprinkled with the bituminous material, whether tar or asphalt, and then rolled and completed with certain surface treatments. In New York State during the past year this treatment has cost from 50 to 60 cents per square yard for a wearing surface 3 inches thick. In Massachusetts, by the penetration method, using 2¼ gallons per square yard of Bermudez asphalt, 2 inches thick, the cost has been 66 to 80 cents per square yard. In Massachusetts, too, in 1914, there was used a surface composed of oil, asphalt and gravel, using 18 gallons of asphalt to the cubic yard of gravel, and spread so as to have a thickness of 2 inches after rolling, at a cost of 30 to 35 cents per square yard, while with oil, asphalt and sand, mixed and spread to a depth of 4 inches, after rolling, the cost was 54 to 60 cents per square yard. Using the penetration method with tar instead of asphalt, with 2¼ gallons per square yard of surface, 2 inches thick after rolling, the cost was 45 to 65 cents per square yard. It must be understood, of course, that these costs will vary, as in some cases gravel was used which cost 80 cents per cubic yard, while in others trap rock was used which cost $2.50 per ton, which is considerably more than the cost of gravel per cubic yard.

There are many other methods of using bituminous wearing surfaces. One of these is known as the Topeka mixture, as it was first used in Topeka, Kansas, and has been decided by the courts not to be an infringment on any patents. It is laid much as is sheet asphalt pavement, but with a larger aggregate. In 1913 over one hundred miles of roads were surfaced in the Borough of Queens, New York, with practically this kind of pavement. The specifications for the wearing surface for this work read as follows:

"The finished pavement shall contain between 7 per cent. and 11 per cent. of bitumen soluble in carbon disulphide, depending upon its mesh composition, but in all cases sufficient asphalt cement shall be used to thoroughly coat all of the particles of the mineral aggregate.

"The mineral aggregate shall be proportioned as follows:
"Mineral aggregate passing 200-mesh screen, from 5 to 11 per cent.
"Mineral aggregate passing 40-mesh screen, from 18 to 30 per cent.
"Mineral aggregate passing 10-mesh screen, from 25 to 55 per cent.
"Mineral aggregate passing 4-mesh screen, from 8 to 22 per cent.
"Mineral aggregate passing 2-mesh screen, less than 10 per cent.
"Screens to be used in the order named."

Roads of this character were laid in New York State in 1914 by the State Highway Department, at a cost of 85 to 95 cents per square yard.

During 1914 some twenty-five or thirty miles of bituminous roads were built upon the Ashokan Reservoir of the new water supply system for New York City. The wearing course was formed of stone passing over a ½-inch screen and through a 1½-inch screen. By an adjustment of the jackets on the screens a sufficiently graduated stone was obtained to produce proper results. The broken stone was heated and mixed, in a machine similar to one used for sheet asphalt, with an asphaltic cement so that the resulting mixture should contain between 5 and 7½ per cent. by weight of bitumen. The mixture was spread upon the road and thoroughly rolled, when a seal coat of hot asphaltic cement was spread over the same by a proper appliance, and then smoothed off with squeegees. The asphaltic cement was applied on the average at the rate of a little less than one gallon per square yard. Upon this squeegeed coat stone chips were placed, which were thoroughly rolled into the surface, any lack of chips being supplied by a second distribution. The wearing surface 2 inches thick cost $1.01 per square yard, native stone being used.

It would be difficult, and perhaps unnecessary, to go into a detailed description of the many kinds of bituminous roads. Those herein described give a fair idea of what are in ordinary use.

6. *Concrete Roads.*—During the last five or six years quite a large amount of roads have been constructed having a wearing surface of cement concrete. It was thought at first that this would not give satisfactory results, as it was feared that the concrete would be so affected by the changes in temperature as to crack in cold weather or bulge in warm weather; also that it would be difficult to keep in repair. Possibly the best and best known examples of concrete roads are located in Wayne County, Michigan, in the vicinity of Detroit. The writer had an opportunity of driving over these roads last summer, and he was very much surprised at their good condition. One in particular that was only 9 feet wide and a half a mile long had been in use five years, and had cost during the entire five years but $26.00 for repairs. It is true that on this section the traffic was not great, but on another road, where the pavement had also been laid five years, under quite heavy traffic, the concrete was still in good condition. The cost of these pavements varied according to conditions, as practically all of the material had to be brought from out of the State, and the cost of even the water was great, as many of the roads extended into the country long distances from any watermains. The concrete for these roads was generally laid to a depth of about 6 inches, and the cost on the average was about $1.35 per square yard. On Michigan Avenue, however, the concrete was laid an average depth of 7 inches, mixed in the proportion of 1 part of cement, 1½ parts of sand, and 3 parts of gravel. In this particular case the cost of the concrete was $1.47 per square yard. In Massachusetts the cement concrete roads laid in 1914 were of an average depth of 7¼ inches, and cost from

$1.40 to $1.55 per square yard, while in New York State, with a mixture of 1 part of cement, 1½ parts of sand and 3 parts of broken stone, averaging 6 inches in thickness, they cost $1.00 per square yard. Concrete roads are sometimes covered with a thin coat of bitumen, the idea being to prevent the wear of the concrete and get a more resilient and a less noisy road. There has been some difficulty in making the bitumen adhere to the concrete. The practice of using the bitumen has not yet become general.

7. *Brick Roads.*—In the Central West, where paving brick is cheap and good, a great many brick roads have been laid. This is especially true of Ohio, and particularly around Cleveland. The writer in 1914 made an examination of many of these roads; while some of them showed some defects, probably due to lack of drainage, as a whole they were in extremely good condition and must be a great boon to the farmers and other people living in the vicinity of Cleveland. It happened that the time the inspection was made was soon after a rain, when the clay of that country was in exceedingly wet and sticky condition, so that, when sometimes it became necessary to take an unimproved road to get from one brick road to another, the value and convenience of the brick roads were especially appreciated. These roads are expensive, as all of the material has to be transported for quite a distance, and much of it by horse-drawn or motor vehicles, as the roads are sometimes quite a distance from the railroads. The cost in that vicinity for brick with a cement filler is from $1.00 to $1.10 per square yard, not including foundation. In New York State, in 1914, brick cost $1.55 per square yard.

It sometimes happens that, on account of the heavy traffic in the vicinity of cities, roads are constructed that are practically street pavements. In New York State, in the Eastern district, some asphalt block pavement was laid in 1914 at a cost of $1.40 per square yard.

It does not seem necessary or pertinent at this time to go into the merits or descriptions of the different kinds of road pavements, as that would mean an extended discussion.

Which one of the foregoing methods of improved road construction is to be used depends upon several conditions. The first of these is the ability of the county or State to pay for the work, and then there must be considered the amount of traffic which will use the road and its character. There is absolutely no use to plan a road, no matter how well adapted it is to conditions, if there are no funds to pay for it. With a limited amount of money the problem is to obtain results with that money, and in order to do this a complete investigation must be made of both the amount and character of traffic, because if the road is to be used by heavy vehicles, a different form of construction is required from what would be called for if the same tonnage were to be drawn over the road in smaller loads. It is possible that heavy loads may be so infrequent that they can be left out of consideration entirely, but if considered, upon their frequency will depend the treatment that should be given to the road.

If, however, funds are available to build the best road from an economic standpoint, the problem is somewhat different, as the matter of first cost is not so important as ultimate cost. In considering the ultimate cost, and assuming that the roads are built out of the proceeds of a bond issue, as they are in New York State, the expense is not the first cost, but the interest on the first cost, the cost of repairs, and the amount of money to be paid in each year for a sinking fund that will pay off the bonds when they become due. And in this connection it

should be said that in any bond issue made for a road improvement, or for any other improvement, the term of years for which the bonds are issued should be equal to the life of the improvement as nearly as it can be estimated.

It is also necessary that the deciding official should understand fully the properties of each one of the different roads, so that he will know the ability of each one to sustain the traffic that he finds will be applied to it when constructed. He must understand too that a road when improved is liable to attract traffic, and that as a general rule the traffic will be much greater after a road is improved than before.

Having determined the type of road to be used, the exact material must be determined. This is an engineering proposition, and the availability of the material must govern the choice to a great extent. Trap rock, for instance, might work out as the most economical from a general standpoint, but might be prohibitive on account of the cost of transportation. It often happens that a less valuable material will prove most economical, on account of its propinquity to the road, than a better material which must be transported some distance.

In this consideration it must be understood that there is a natural as well as a traffic life to road material; that is, gravel, stone, or brick will have a life according to the traffic, as they are not acted upon by atmospheric conditions; while, on the other hand, asphalt, coal tar, or other bitumens are acted upon directly by the atmosphere and, even without traffic, have a certain life.

A careful study must be made as to all of these conditions, the first cost and the cost of repairs of the different kinds of wearing surfaces, together with their characteristics, as well as the availability of the different materials. With all these items before him, an official can determine pretty accurately which is the best surface to be used.

THIRD SESSION

Tuesday Afternoon, March 23, 1915

U. H. DANDURAND, ESQ., in the Chair.

THE CHAIRMAN: I have much pleasure in introducing to you President Falconer, of the University of Toronto, whom I am sure you will be delighted to hear.

ADDRESS.

PRESIDENT R. A. FALCONER, UNIVERSITY OF TORONTO.

Mr. Chairman and Gentlemen:

I am very much pleased to be here and, on behalf of the University particularly, to welcome you to the use of our buildings, and to say how pleased we are that you are able to hold your Convention in this building. I should like to have been here at the opening, but I was in Chicago and only got back this morning.

A meeting of this kind, following, as it does, a very important meeting that was held here last May on City Planning, shows that people are becoming awake to the necessity of providing for the comfort of the general public, by making Good Roads which will, before long, react favourably on the social conditions of the country. In the earlier days, when the people were kept far apart, civilization could not come to the pitch to which it has come to-day. Civilization depends to a great extent upon the means that people have of exchanging views of life, of seeing one another, and of coming into close contact one with the other. The more countries that are opened up by various means of transportation, the higher becomes the grade in which that country stands in civilization. Therefore we can estimate to a certain extent by the amount of interest that we take in such a convention as this, and the desire that exists on the part of our various peoples for better means of communication, the advancement we are making in civilization.

At the same time we are having these conventions, we are discussing seriously the problems that are being thrust upon us by the enormous development of our modern countries in this western world. There are periods in the world's history in which we are very noticeably confronted with movement of population. We have been going through that period in the last generation. The peoples of the world have been in a stage of movement—waves of population rolling from the east to the west. That wave of population floated in very heavily upon the United States, and in the last few years it has reached our shores, and has broken upon our shores proportionately very much greater, considering the population, than it did in the United States. This movement of population, the incoming of new peoples, has forced upon us certain problems to which we have been too indifferent in the past. Of these, one of the most important is the relation of town and country. Towns have been growing too rapidly in most cases and have been growing up in a haphazard way. People seem to imagine that mere size in a city is all that should be required, as though there is a blessing in a million of people more than there is in five hundred thousand. These are things that we have to consider—how our cities should grow; how large they should become; and how they

should be related to the country. The cities are drawing from the country many people who would be far better off in the country, and who would live a far richer life in the country. If we drain the country too much and bring people into congested cities, we shall lessen the real quality of the average man of the country and city. Anything that enables us to equalize the attractions of town and country must receive our most careful consideration. One reason that the movement for Good Roads appeals to me is because I see in it one of the most potent factors for bringing out a rational proportion between the life of the city and of the country.

This demand for Good Roads comes at a time when there have been such changes in the method of transportation that there is a necessity to provide a basis on which the new machinery may be worked. It is very remarkable how certain discoveries transform industry. The summer before last I was spending a holiday down on the Nova Scotian coast. I had lived as a boy down in these regions. In those days the fishermen had their ordinary sail boats. They went out at certain periods of the year to fish. They led a precarious existence and had not a very continuous sort of livelihood. They depended a great deal upon the weather and in certain seasons of the year, when perhaps prices would be higher in other places, their fishing boats were such that they could not face the weather, and they could not secure the results of the good market. The introduction of gasoline changed all that and almost every fisherman along the coast now has his gasoline boat, and that has revolutionized the fishing industry. They can fish all the year round and to a certain extent they are independent of the weather. They know the price and they can get it. In the same way we have the change in motor traffic and that is making possible a change in the relation of town and country, and this whole movement for Good Roads gets an emphasis that it would not have had in the past.

Therefore I think at this time it is becomingly opportune to have such a convention. It is becomingly opportune for us to have it now in Canada because, whatever the war brings to other countries, it looks as though before long in Canada we shall have another question of large cities looming up before us. Whenever you say large cities, the question of cost of living comes up. The question of cost of living in such a rich country as this is conditioned to a large extent by the means of transportation and Good Roads. These are vital factors in dealing with large cities. From a country point of view, Good Roads are also quite necessary. Life is becoming so complex; the telephone and the newspaper by reaching every home are enlarging the scope of the average life of those who toil all over the country. Wherever you get that stimulus of ideas that comes through being in touch with the outside world, there comes a demand for a larger and richer social life, and your larger and richer social life is undoubtedly furthered by the whole system of Good Roads. From the point of view of the higher class of life in the community and a rising civilization in the community looking at it from that rather abstract point of view, one welcomes this whole movement. One welcomes the Good Road movement because economically it will mean such a great deal for those whose life is in the country, as well as for those whose life is in the city. It will not be long until we have to ask ourselves how are we going to deal with the congestion in which people are living in the cities. Is it not going to be possible to get people from the cities out into the country? Is it not possible to relieve the pressure of the cities? Is it not possible at the same time to bring those who live in the country, with their healthy life, into the

cities, and yet not have them there permanently, denying them the happier life they have in the country? All these problems that face us are so intimately connected with this question of Good Roads that we in the University gladly welcome you as contributing, not only to the problems which lie directly before you, but as indirectly contributing to solve the very large problems that are pressing in upon every thinking man in this community.

We are also glad to see you in the University, because undoubtedly from the University there will go forth many men who have been educated as engineers. We recognize more and more the necessity of efficiency in every line. I am not going to speak for the next moment or two to those from the United States; it would be rather impudent to speak to them. I am going to speak to my own countrymen for the moment. In Canada we have a very high average of people, and we are surrounded with a rich country. We Canadians have been presuming too much on our average ability and our high average character and our natural resources, and we have been assuming that things will go just as they have been going, without any special regard being had to economy and waste. The result is that, unless we in Canada are careful, we shall find ourselves, before many years go by, surrounded by problems from which it would be very difficult to extricate ourselves. One thing that we ought to learn by this war is the necessity of guidance by experts. Your engineer who can build a road economically, who knows how to build a road without waste, who can tell you where to place it, who can tell you how it should be maintained, that expert is a man of prime necessity for a country like this.

We must do more and more, in all branches of life in Canada, to turn out men who can guide the people in the right way. The day of the happy-go-lucky man is past. We are facing a nation to-day which, because of magnificent efficiency that has been directed in wrong lines, is able to give us considerable trouble. Leaving aside the wrong direction, there is the fact of efficiency and the fact of capability. The Canadian must face the necessity of developing his energies with efficiency. When this is over we must address ourselves to thoroughness from the ground up to the very top—thoroughness in school, thoroughness in business, thoroughness in professional life, thoroughness all through. We have no margin to waste. We cannot afford to throw things away even in this vast country, and we must take that energy and train it and use it economically. If we as a people come short, it will not be because we have not natural ability. The average natural ability is in this country. The people have it. No country has a higher quality of it. But with that natural ability we must have skill and expert knowledge. We must get away from the old ideas that we had that things will right themselves if only we have infinite optimism. The west is suffering from an undue optimism. If there had been a little more expert knowledge and a little more sanity, they would not have been led by their optimism where some of them are to-day. Optimism is not sufficient for a country. Ordinary average ability is not sufficient for a country. Expert knowledge, thoroughness, realization that our resources must be economically husbanded, these are things that we have to learn, and conventions of this kind, if they teach us these facts, will be of enormous advantage.

It has been a great pleasure to be with you this afternoon. (Applause.)

"FINANCE."

S. L. Squire, Esq., Waterford, Ontario.

Mr. President and Gentlemen of the Convention:

I felt at the outset that possibly the most important question on the programme was that of finance and, while that was my conclusion before coming to this Convention, I am more convinced of its importance at the present time, because I can safely state that there has not been a speaker who has dealt with any question at this Convention who has not, in some way, interlaced the question of finance. We have been very much interested in the address given by the President of the University, and listening to him, I thought that we, as a young nation, if we are properly led, will be able to create a fabric which would in design be more complete, more perfect, and more beautiful than the design which has ever been worked out by any country or nation that the world has ever known. What we need to understand is that, individually, we each depend upon the other, and that we each have an important function to perform. The subject which we have been given to consider this afternoon in connection with the financing of improved highways is probably the basic one of the entire programme. For while engineers may devise, and labor be prepared to execute, unless the necessary means are provided, all else will be in vain.

It has been stated, and perhaps it was truly said, that the need of Better Roads required no further discussion, that all (speaking at least for Ontario) are agreed as to their necessity. This may or may not be true, but if it is, I wish you to remember that the fact is equally true that, with the present knowledge possessed by most of the people in the rural sections, they consider the roads they have preferable to any improved roads promised, if the cost is very great. I submit that while the rural resident of Ontario, and perhaps of Canada, possesses just as much ability to think as does the resident of the larger centre, knowledge is not assimilated in the same rapid manner in the country as it is in the city. I was very glad to hear President Falconer state that he believes that the average intellect of the Canadian is fairly high. I believe he will find that there is as much ability in the country as in the city.

We hear of the country and the city being brought daily more closely together, and this is true, but the rural mail and the daily paper are not as yet sufficient to overcome the spoken word. You will find that, in spite of all that has been said in favour of improved highways through the press and other agencies, the uncertainty of cost to the individual exists in the mind of even the most intelligent of the rural residents. We do not have to go far to hear men say that the building of such permanent roads in our country will cost us our farms, and with this impression in their mind they are surely opposed to such expenditure. Where has this idea been obtained? The spoken word of some imaginative neighbour who has busied himself in creating false impressions gained through malice or ignorance, and these have scattered themselves broadcast—until to-day, if a referendum of the farmers in Ontario were taken in the counties or groups of counties which have not adopted any system for the improvement of highways, you would find them strongly opposed to improved highways, as they are at present understood; and since in Canada the majority is found in the country, the question of finance becomes more and more important. I contend then that the country everywhere

is ready for improved highways, provided it does not cost too much, though some of us may say that we will accept them, provided thay are financed without our assistance.

Another question: Do you thing it is a Canadian characteristic to count something for nothing? Are we not willing to accept the things which we consider advantageous to us at the hand of Divine Providence, a generous Government, or a liberal friend, without so much as a "thank you"? And do we not hesitate to entertain any proposition provided there is attached to it personal cost?

I am not criticizing the rural resident. The man in the city who wants to take short cuts in this direction that the rural resident knows nothing about (for instance by real estate, mining stock, and market gambling), is fed by a desire to get rich quickly. To get something for nothing only presents another form of the characteristic shown by the farmer when he is willing to accept the advantages of improved highways when the Government or his neighbour (in the sense of the other persons) pays for it. If this is true, how can this deep-rooted impression be overcome, and a willingness be created to pay a legitimate amount for benefit received? For the roads cannot be built without money, and a large amount of money.

First of all, let us consider in this connection the question—can we afford such an expenditure? Let me deal with Ontario, believing that what is true of Ontario is true to a greater or lesser extent of all the Provinces. The Commission appointed by the Ontario Government in connection with road improvement placed as an initial basis in their report last year the expenditure of $30,000,000 within fifteen years as organization and demand might warrant, reaching about two and a half million as a peak load in any one year. This would mean an expenditure of an average of $1.00 per capita per annum, or with approximately fifteen million acres of land in Ontario under crop cultivation, would call for an expenditure of 16c. per acre—provided, of course, that the entire expenditure recommended by the Commission was to be levied upon the land. Otherwise (to carry the cost question to a conclusion and to follow the recommendation of the Commission, apportioning the payments as recommended by them) provided that the counties were to pay 40 per cent. of the amount required, the Government contributing 40 per cent., and the cities 20 per cent. of the entire cost, the assessment of land per acre under crop cultivation for this purpose would be less than 5c. per acre. If the average 100-acre farm has sixty acres cleared and in shape for crop, the average cost for a 100-acre farm would be about $3.00 per annum—truly a stupendous amount, less than 1/10 of a mill on the capital invested in agriculture in Ontario. Surely that is not a tremendous undertaking. It is not one that would warrant a man in saying that it would cause him to mortgage his farm, or that he would have to sell his farm in order to pay for it. My purpose in dealing with this in this manner is to brush away, if possible, any illusions and to make clear the probable cost of improved highways, as such cost may affect the average farmer, remembering that, with the start the alarmist has had in many communities, care will have to be taken in our endeavour to undo the damage that has been done.

Now again, we appreciate that the financial side of a question is affected by economic conditions. We are reminded by many that the war and its effects make the present a very inopportune time to consider extraordinary expenditure on highways. The war, Mr. Chairman, is like the bad boy in communities, who is blamed very often for that of which he is not guilty. We all regret this awful war, but is there a man here who, in his heart of hearts, has any doubt about the

ultimate outcome? And if its effects were of a disastrous financial nature, even then would we hesitate to bear our share of the burden? Would it not be incumbent upon us at the home base to develop the heroic in us, as much as it is upon the poor fellow who is our substitute in the trenches to-day? But what is our true financial position in regard to the war? The war has created in Canada an industrial activity in many lines that would have been impossible without the war. The war has caused a demand for agricultural products which has made a "Greater Production" campaign, to say the least, important. It has made a market for our horses, which promised to be a drug, and has given us prices for our products which, without the war, would have been impossible. To revert to the farmer, let us take one production as a basis. Ontario produced something over 20,000,000 bushels of spring and fall wheat. I think we would have been generous if, considering the bumper crop of our neighbour to the south of us, the Ontario farmer had received 80c. a bushel for his wheat. Wheat has sold not at 80c., but in some instances at considerably above $1.60; to place the crops at $1.20 a bushel is certainly a modest estimate. Thus the war has made a difference of $8,000,000 to the Ontario farmer in this one line alone, as much as he would be required to pay as his portion of the $30,000,000 for the improvement of highways in eight years. The increased prices accruing to the farmer due directly to the war have created an added wealth in the past six months, an amount which would more than pay his entire portion of the fifteen years' contribution. The present, with its increased demand for everything the farmer has to sell, is the very time that extra expenditure should be made upon that one first link in the chain of transportation which adds to the cost and reduces the net profit obtained more than any other, the link from farm to market town.

But why take the time of the Association with this? Because the farmer is as keen for dividends as is the manufacturer, and you must show him with care that you are asking him to invest with you in something which will pay him a liberal dividend. He doesn't hesitate to spend money for machinery. If you show him that this is a big partnership game and that, while it is not to get something for nothing, he has invested his money against your money and not his hard-earned money against your experience or your promises, if you awaken a spirit of co-operation and engender confidence by proof of honest administration, making him know that you have an interest in him and in his wishes other than the money you get out of him, and if you do not take too much for granted and expect the rural resident to know as much about the whole scheme as do the men who have spent years in considering its various phases, you will find him a willing investor and ready to do his full share of the paying.

I am willing to assume that the report of the Commission has been favourably received by the Government and the people at large, and that the division recommended by them may probably be carried out. I am not concerning myself with how the Government may provide its portion of the forty per cent. We are given to understand that even Governments to-day have some difficulty in financing, but if the one item which has proved a revenue producer to the Provincial Government in the past ten years for the first time, the amount received from automobile licenses alone, were capitalized, it would prove enough to pay the interest and sinking fund for the amount that the Government might be required to contribute. It has been whispered that the Ontario Government is not likely to take a forward step upon this question at the present time. Let the Government raise the forty per cent., and let it take the forward step. After all, are the resources of this country impaired by this war? True, we have a time of depression, but are those

things which are basic affected? Is the agricultural life of this country less prosperous than it was a few years ago? Is the mineral wealth affected to any great extent? Are our fisheries less productive than they were? Is our lumber industry less important than it was? Those things which are basic are just as substantial to-day as they ever were. It is only those things that have become inflated through speculation that are suffering. If then, our country is substantially in as good a financial position as ever, it seems to me that now is not a time to hesitate, but now is the time to show that we have confidence in this Province. It is time that we took a forward step. The matter of how the cities are to raise their twenty per cent., I am not going to deal with. The cities have a way of financing that we in the country would hesitate to adopt. This is shown by the fact that when the city is asked to vote a bond issue for public improvement for an amount which would stagger the average rural mind, the same is readily carried and does not create even a passing interest.

I consider then that the important financial part of this whole question rests with the rural sections of our country, and to me the important part of the whole question is the creating of a willingness on the part of the rural communities to pay that portion which they justly should pay. In order to do this, they must be convinced of the fair distribution of cost. I believe the farmer is willing to pay for the benefit which he is likely to receive, and he feels, perhaps not without reason, that in many instances he has been asked to pay the lion's share for road improvement. Wherever highways are used for other than local purposes, they object to paying the full cost. We must, as a Convention, convince the rural portion of the Province or the Dominion that all that we expect them to pay in connection with the improvement of highways is that portion which will be for their direct benefit and that, whenever highways are to be used for other than local uses, a liberal amount will be contributed from other sources, with the further assurance that, wherever economical, money expended in any community will, as far as possible, go into the pockets of residents of such community. There is a fearfulness in the minds of many that the money so expended will be paid for high-priced labour, and that not even a small portion will be left in the section which contributed it.

In connection with county financing, we would advocate short-term bonds, thus reducing the interest charges. The present system of building roads in the country by Statute Labour is not only expensive, but does not produce the desired results. This is recognized by the farmer, but because he understands the rural system better than the system which has been approved, he is willing to see his money almost wasted rather than try the new. If, as it seems, the financing of the forty per cent. or that portion which is to be raised by rural Ontario is the most difficult, could this not be simplified if we asked the counties to pay fifty per cent., with an assessment of benefited land amounting to twenty-five per cent? This last would include all that area which has been so benefited that farm values have really been increased by the building of such roads. The remaining twenty-five per cent. would be met out of a fund procured by capitalizing the commuted Statute Labour on all land where Statute Labour would be eliminated by the building of the Government or county improved highway. Thus for a road which would cost on the average $5,000 per mile and which would be paid for in the manner beforementioned, by the Government paying 40 per cent., the city 20 per cent., and the counties the balance, on that part which the county assumes, say $2,000 per mile, the amount to be raised by the county rate would be $1,000 or 20 per cent. of the whole cost, by assessment for benefit $500 per mile, and by capitalizing the

Statute Labour $500 per mile. The average assessment in a certain township per 100 acres is given as $4,000, which to-day contributes seven days' road work. This is placed by the city council at $1.50 per day. As the township is laid out, we would find 1,200 acres bordering the road for each two and a quarter miles, which would contribute 84 days' road work. If this was commuted and capitalized, on a 15 year term at 5 per cent., it would yield $650 as an amount to be expended for road improvement, which is more than the 25 per cent. required on the expenditure mentioned. In conclusion, don't make the rural man feel that he will wait for the last serving. My contention, Sir, is that the financial problem confronting us is not one of our ability, but of our willingness.

DISCUSSION.

H. J. Bowman, Esq., County Clerk and Treasurer, Berlin, Ontario.

In Canada the principle of Federal Aid for road construction was unanimously approved in Parliament, but partly differences defeated it; it is to be hoped that after the war it will be available. As all the people will receive benefit from Good Roads, they should all help to pay for them, and a Dominion grant to the Provinces would accomplish this. In the meantime the Provinces will have to do the best they can. The Province of Quebec is giving very liberal aid for road building; money is loaned to the municipalities at two per cent. interest and the Province provides the sinking fund. Such generous treatment should soon provide Good Roads in the Province of Quebec.

In Ontario, the Highway Commission has recommended to the Legislature a method of dividing the cost of road construction and maintenance between the Province and the municipalities. The report of the Commission seems to be approved by the people of the Province, and it is hoped that the Legislature will put through the necessary legislation as soon as possible to carry it into effect. The war has necessitated a Provincial tax of one mill on the assessment and after the war it may be advisable to continue a Provincial tax to levy the cost of road-building on all the people. In the United States, a State tax for this purpose is quite common.

The question of finance will have to be dealt with in each county separately, as the conditions are different. In some counties a large amount of work has already been done on the roads and there is a large debt in consequence; in other counties the roads were built by the early settlers and kept in repair by Statute Labour and there is no debt. Some counties are made up of rich agricultural lands and there is a large assessment to levy on for road purposes; others less favoured have a relatively small assessment. Thus the County Council of each county will have to work out the problem of finance in each county to meet the particular situation.

In the County of Waterloo, where the writer is Clerk and Treasurer, the conditions are unique. The County is small in area and within its limits are the cities of Berlin and Galt and the manufacturing towns of Preston, Waterloo, Hespeler and Elmira. A County Road System was adopted in 1908 and has been maintained to date by direct levy on the townships only. The County of Waterloo has only a small debenture debt, as "pay as you go" methods have nearly always prevailed. So far there is no debt for roads, and when the new Provincial legis-

lation takes effect it will be comparatively easy to carry on an aggressive road-building campaign. Whether the money will be raised by debentures or not will be for the County Council to decide. A levy of one mill for County Road purposes on an equalized assessment of $25,000,000 would provide $25,000 and, when the new legislation foreshadowed by the Highway Commission goes into effect this would permit of an annual expenditure of something like $75,000 on the County Roads. This should be ample without borrowing any money.

I listened with a great deal of interest to Mr. Diehl's remarks this morning and his clever defence of the scheme of finance in the State of New York. I do not think 30 to 50 year bonds would be very popular in the Province of Ontario. Of course, these are State bonds and would be quite a different proposition from municipal bonds, but when we consider the large amount of interest that is paid in borrowing money for any purpose, it is time that the municipalities should consider whether they had not better pay as they go. It has been said that the City of Toronto has a debt of $87,000,000; that is a larger debt than the debt of some countries in Europe. In the City of Detroit, where they pay as they go, their debt is only about one-tenth of that, and they have about the same rate of taxation. If you figure out the amount of interest that is paid on the bond issue of $100,000 at 5 per cent., you will pay back $160,000 in 20 years. By paying as you go you will save that $60,000.

With the distribution of the cost of roads between the Federal and Provincial Governments and the cities, it would help the matter out considerably, and I imagine that, even in the County of Norfolk, the farmers would help pay for Good Roads if the cost was distributed.

THE CHAIRMAN: As Honorary President of the Dominion Good Roads Association, allow me to thank the delegates for attending in such large numbers. Those of you who were here yesterday know what a hearty welcome we received from His Honour the Lieutenant-Governor, from the Honourable Mr. Macdiarmid, Minister of Public Works, and from His Worship the Mayor. As a matter of fact, we received the Freedom of the City of Toronto. Yesterday afternoon, after leaving this gathering, his Worship took me to the City Hall and I had the pleasure of addressing a few words to the City Council with my good friend Mr. Michaud, and I desire to express my appreciation of the exceedingly cordial way in which we have been received. This question of Good Roads is a vital and important one, and I am glad to see it is being taken up in a permanent way. I am proud of having made a motion last year to make this a permanent institution, and I hope you will choose officers and another city in which to hold a Convention next year. If no other city makes a bid for it, I think Montreal is big enough to welcome you next year. I have very much pleasure in asking Mr. Michaud to address you for a few moments. He is Deputy Minister of Roads for the Province of Quebec.

"ROAD LAWS."

B. Michaud, Esq., Deputy Minister of Roads, Quebec.

Mr. President:

You thought that it would be useful for me to speak here of the road work of the Province of Quebec, and of the laws relating thereto. You have seen in this, no doubt, an opportunity for some to learn something new; for others—as is inevitable—something to criticise; and probably for the largest number, an occasion for making interesting comparisons between our system and theirs, or between ours and those of other countries and other Provinces. I scarcely need to say that I accepted with pleasure a suggestion which I considered as a compliment to the people of the Province of Quebec, to their ideas, their works, and their character as business men. I have doubly then to thank you: for the honour which is done me personally, and for the flattering opinion which your invitation admits of for the Province which sends me to your Convention. I realize the necessity of asking the indulgence of civil engineers for a subject which for a few minutes will carry them away from pure considerations of their art and bring them down to the ground level of legislation. This indulgence, however, will be easily granted when they reflect that, for the full exercise of their usefulness, both a field of action and money are necessary, and that without the intervention of Governments or Parliaments—at least so far as this country is concerned—the horizon of road-builders would be very much narrowed and their finanacial resources limited indeed.

I will now briefly enumerate a few facts and then enter upon the real subject of this study.

The Facts:

In the Province of Quebec there are about 1,130 rural municipalities, and the total length of the roads is about 45,000 miles. Of these 45,000 miles, about 15,000 miles of earth roads are regularly and systematically maintained under control of the Road Department.

Since 1908, we have gravelled 416.45 miles of road, including the main Provincial roads.

Since 1908, we have substituted 9,665 concrete bridges or culverts for small wooden bridges. (This number does not include the concrete bridges and culverts on the roads constructed under the provisions of the law of 1912.)

Since 1912, we have built the Edward VII. Road between Montreal and the frontier near Rouse's Point (about 39 miles). The part of this road with which we are concerned was finished in 1913.

In 1913, we commenced the construction of a road between Montreal and Quebec, on the north shore of the St. Lawrence. This road follows the river for all but a few miles of its course. It will have no grade in excess of 5 per cent. I do not hesitate to say that its construction will effect a complete transformation of traffic in the country through which it passes, and particularly in the neighbourhood of Montreal and of Donnacona, on the Jacques-Cartier River. In these particular localities the land is very hilly. At the approaches of the Canadian Northern bridges at Charlemagne, near Montreal, when the spring floods occur there are practically no roads at all. We have made embankments which

will almost completely do away with this inconvenience, and shall continue to build them as found necessary. At Donnacona we are about completing the reduction to 5 per cent. of grades, which formerly were from 15 to 18 and 20 per cent. This road is about 150 miles long. There are 43 miles macadamized. We hope to finish it next fall, except in certain parts, where new embankments will not permit the laying of macadam.

In 1914, we opened and gravelled 46.5 miles of the Levis-Jackman Road. This road starts from Levis and goes as far as the American frontier, connecting finally with Jackman, a village of Maine. It follows the Chaudière river and its tributaries throughout almost its whole course. We will finish it next summer. This road is built directly by the Road Department, except the bridges and culverts, which are done by a contractor. Its total length is 93 miles. Of these 93 miles, about 20 are already macadamized or gravelled by the municipalities interested.

The Sherbrooke-Derby Line Road, about 33 miles, is being constructed. About six or seven miles of it will be macadamized, and the rest gravelled.

Since 1912, nearly 300 municipalities have asked permission to avail themselves of the advantages offered by the Government for macadamizing and gravelling their roads under the provisions of the Law of 1912.

The Road Department owns 58 macadamizing plants, which it rents or lends to municipalities as the case may be. It also owns other machinery, such as rollers, traction engines, road graders, cranes, horse shovels, etc., which are now being used in the construction of the Levis-Jackman road, and which will be employed elsewhere as occasion requires. Apart from the machinery plants belonging to the Government, 143 are owned by different municipalities in the Province.

All the work of macadamizing, gravelling, and maintaining earth roads which is done in the Province is regularly inspected. For the inspection of macadam work the Province is divided into twelve districts, to each of which an inspector is attached. The inspectors themselves are under the directions of a Superintendent. Each instructor, inspector, or employee at work on a road has to send a post card to the Department each day, indicating the work done by him the day before.

Each year the Parliament of the Province votes an amount "for the improvement of rural roads," in addition to which grants are given (*a*) for their maintenance, (*b*) for macadamizing, (*c*) for gravelling. This year the amount voted is $250,000. Previous to the Loan Law it had been as high as $350,000.

Since the coming into force of the Good Roads Law of 1912 (authorizing loans), there has been spent as well as the $10,000,000 voted by this law a sum of $8,941,746.39 (to March 10th, 1915), for roads macadamized or gravelled by the municipalities, and also for the purchase of machines by these municipalities and for the construction of Provincial roads. The amount spent for these same objects during the current year (from July 1st, 1914, to March 10th, 1915) is $5,085,687.20.

The cost per mile of Provincial roads is higher than the cost in the municipalities, but it is not fair to compare the work done on these roads with that done by the municipalities themselves. In fact, these municipalities do little earth work and only build bridges and culverts of less than 8 feet span, while the Government does a large amount of earth work and is often called upon to construct bridges of considerable length (at Donnacona, on the Montreal-Quebec road, we are to build next summer a concrete arch of 155 feet), and we must add the cost of buying lands, paying indemnities, and the expenditure required for special work rendered necessary by the changes in the surroundings.

I do not for a moment pretend that no road work was done in the Province of Quebec before 1908, or that there was no propaganda or educational movement with a view to the improvement of our roadways. This would not be just to those who preceded us. But it is only since the epoch I have mentioned that this movement has assumed the importance and the popularity which have produced the results already described. How have we attained them? What causes have produced these effects? What means, what transformation of means have contributed to the present conditions? To these different questions I will reply by relating the genesis of our Road Laws and by explaining their operation and effect.

The Laws:

The making, improvement, and maintenance of roads are regulated by the Municipal Code. This collection of laws has produced in the Eastern Townships, for instance, several good results, due to the fact that this part of the Province, in virtue of the provisions of the Code, submitted itself to the exceptional system of vesting the control of road maintenance in the municipal councils. In general, however, the provisions of the Code have not had the desired effect, or at least the results that are looked for to-day, and that because, while conferring certain rights and imposing obligations, their application remained at the mercy and risk of isolated initiative, often rebuffed by the apathy of the ratepayers, and nearly always discouraged by the lack of means. Special laws were needed, which while based on the code would introduce a new element calculated to stimulate the adoption of good methods.

Law of 1911 (Authorizing Grants).

The germ of our special road laws consisted of a little credit inserted in the budget of the Department of Agriculture and of an ordinance regulating the grant of money for the purchase of machines (1897). This ordinance granted aid to the extent of $125, $100 and $75 respecively to the three first municipalities of a county to buy a road grader, the amounts to be awarded in the order in which applications were made to the Government. Moreover, the Government gave a grant not exceeding $1,200 to any county council which purchased a stone crusher. This measure did some good, but little by little the Government saw that it would be insufficient if not developed and extended. So in 1907, after some years' experience, it was decided to go farther. As I have already said, in a certain part of the Province, in the Eastern Townships for instance, in virtue of the provisions of the Municipal Code, the roads are under the control of the council. The only defect of this system is that it permits the employment of Statute Labour, or *la corvée*, as it is called in our Province. It was thought that, perfected and made general throughout the Province, it would produce a material improvement in earth roads. As there is nothing coercive on the subject in the Municipal Code, and as it was not desirable to use arbitrary means, the policy was adopted of offering to the two first municipalities in a county which placed their roads in charge of the council an annual grant of 50 per cent. of the expenses of maintenance, not exceeding $400. This was the Law 7 Edward VII., ch. 3 (1907). It worked well enough, but it was soon perceived that limiting the grant to only two municipalities in a county was not responding in a satisfactory manner to applications, which were already numerous.

The law was therefore amended by the Act 8 Edward VII., ch. 10, in such a manner as to put a total sum of $800 a year at the disposal of the municipalities of a county, thus permitting all of them to have their share. This new step was in the path of progress so far as the movement was concerned, but it was inconvenient so far as it limited the grant that might be earned by each local municipality, and it was necessary to remedy this later. The Law 8 Edward VII., ch. 10 not only modified the law relative to the maintenance of earth roads, but it contained provisions relative to the making of macadamized and gravel roads. It guaranteed to each local municipality a grant equal to the half of its expenditure for macadamizing or gravelling, provided the grant did not exceed $500 a year. These works had to be made according to the rules and specifications prepared or approved by the Department of Agriculture, and no grant could be paid unless a statement of the expenditure certified by the Secretary-Treasurer had been transmitted to the Minister of Agriculture. The provisions of which I have spoken decreed that the works of macadamizing or of gravelling could only be made at the cost of the entire corporation. The Law 9 Edward VII., ch. 25 (1909), permitted a municipal corporation to have the works of macadamizing or of gravelling done at the expense of certain ratepayers responsible for certain roads. Naturally these works must be requested by the ratepayers, and by a petition signed by the majority among them if it is a question of macadamizing. (Municipal Code.)

These different laws were consolidated by 1 George V. (2nd Session), ch. 21 (1911). This consolidation, modified since by 2 George V., ch. 21 and 22, and 4 George V., ch. 18, constitutes to-day the whole of the laws in virtue of which the Minister of Roads is able to give to rural municipalities and to villages (*a*) a grant for the maintenance of roads, (*b*) a grant for macadamizing, and (*c*) a grant for gravelling.

The characteristic traits of the Law of 1911, as it stands completed to-day, are as follows:

1.—(*a*) Each rural municipality may obtain an annual grant of $400 for the maintenance of all its roads;

(*b*) Each rural municipality may obtain an annual grant of $200 for the maintenance of its by-roads. (Before the law of 1911, in order to receive a grant a municipality had to place all its roads in the hands of the council. This provision having deterred several municipalities which were not ready for the change from receiving grants, the law was modified as above indicated);

(*c*) The two first municipalities in a county which place all their roads in charge of their council are entitled to receive for two years a grant equal to three-quarters of their expenditure; but this three-quarters must not exceed $600 in the case of the first municipality and $500 for the second. If they have passed their by-law at the same time, the grant would be $550 for each;

(*d*) Each village municipality, if it places all its roads in charge of the council, may receive an annual grant equal to 40 per cent. of its expenditure, provided such grant does not exceed $200;

(*e*) Each village municipality, if it places only its principal road in charge of the council, may receive an annual grant equal to 40 per cent. of its expenditure, provided such grant does not exceed $100.

None of these grants may be received unless all the roads mentioned in the by-law are kept in good order. On different occasions, notably in 1913 and 1914, the Minister of Roads completed the provisions of the law by making ordinances relative to the employment of the money spent for maintenance, and prescribing

certain supplementary obligations to be met for the obtaining of the grant. He made these ordinances known by means of circulars addressed to all the municipalities. The most important provisions of these circulars are the requirement that the municipalities must submit their roads to Government inspection, and the obligation to employ a portion of the money given for maintenance in constructing works of a permanent character, such as the raising and removal of large stones, the construction of culverts where there were none before, and the removal of wooden culverts and little bridges projecting above the level of the road.

The effect of these laws, to which up to the present time about 400 municipalities have conformed, is to cause the disappearance of the system of road work by *corvée* or by shares, and to secure a regular care of the roads and a central control, proceeding directly from the municipal council.

II.—(*a*) Each rural municipality may obtain a grant of $1,000 a year, equal to 50 per cent. of the macadamizing done by it. If the municipality does gravelling only, the grant will not exceed $500. If it does both, the total grant is not to exceed $1,000;

(*b*) Each village and municipality which macadamizes its principal road may secure a grant equal to 40 per cent. of the expense incurred, provided this grant does not exceed $1,000. If it makes only a gravel road, the grant must not exceed $500. If it does both classes of work, the total grant will be limited to $1,000.

(*c*) A rural municipality which completely macadamizes a road crossing its entire length may receive a special subsidy fixed by the Minister of Roads in addition to that of $1,000, equal to 50 per cent. of the cost of the road;

(*d*) A rural or village municipality which does not wish to do macadamizing or gravelling at its own expense may pass a by-law providing that these works shall be done at the expense of certain ratepayers, provided that these ratepayers ask for it by petition signed by the majority of them. This petition is not necessary if gravelling is desired. (The part of the road macadamized must in the case of a village, be a part of the principal road.)

III.—(*a*) All grants for macadamizing or gravelling are paid over and above those given for maintenance;

(*b*) All the expenses incurred by the municipalities for maintenance, macadamizing or gravelling are payable by them by means of direct taxes imposed either on all assessable property or on a certain portion thereof, according to circumstances;

(*c*) Each of these municipalities may transfer to the council of its county its rights to the grants guaranteed by the law.

In many cases, if not in all, it would have been difficult for municipalities to avail themselves of the law if, in addition to the costs of construction properly so-called, they had had to buy out of their own resources the machines for the making of macadam. Consequently, from the very commencement of the application of the law, the Government procured a certain number of road-making plants, which it placed gratuitously at their disposal. It also furnished gratuitously, at the same time as the machinery, an instructor to direct the works. Half the cost of operating the plant (the salary of the stoker and the roller engineer, the cost of fuel, oils, spare fittings, etc.), is also paid by the Government over and above the grant guaranteed by the law. To assure the good working of this system, the Road Department has organized a supply store, by means of which it can rapidly attend to the repairing of the 57 complete road plants which it now owns and which are placed at the disposal of the municipalities.

The by-law prescribing the works of macadamizing and gravelling also provides for the maintenance of macadamized or gravelled roads. The specifications contained in these by-laws are prepared by the Department itself, after a detailed inspection of the roads to be improved. The works of macadamizing or of gravelling are subject to the approbation or to the direction of the Road Department, which also controls and verifies all the expenses incurred.

Law of 1912 (Authorizing Loans).

The Law of 1911, of which I have spoken, offers a serious disadvantage for the greater number of the municipalities. In fact, no matter how much is spent each year for macadamizing or gravelling, the annual grant paid by the Government never increases. Thus, if $2,000 is spent in one year for macadamizing, the municipality receives $1,000. The same subsidy is received if $5,000 is expended. In some places this system is satisfactory enough, especially for those who prefer to pay at once all that they have to pay, to receive the subsidy that is coming to them and to finish with the affair. In the majority of cases, however, the system does not altogether please the municipalities, some of which do not dare to undertake the work because of the immediate large outlay it would involve. If the Government had confined itself to the law of 1911, the development of the macadamized or gravelled roads would probably have been effected, but not for years and years would it have caught up with the requirements of traffic.

The Government therefore resolved to procure itself the money required to pay all the expenses incurred by the municipalities, and it had the Good Roads Act of 1912 passed, which authorized it to borrow $10,000,000. This amount was raised to $15,000,000 during the course of the last session. I will not detain you by explaining the different phases through which this Law of 1912 has passed. It is sufficient for me to indicate that, in its first form, it authorized the Government to issue debentures signed by it and by the municipalities; the part of the latter in the obligations being limited to the payment of 2 per cent. interest during 41 years, and that of the Government including the balance of the interest in addition to the sinking fund. The law as it exists to-day does not provide for loans by the municipalities. The Government borrows the money itself, either by the issue of debentures or of inscribed stock. If it is unable to borrow—if the market is unfavourable for instance—it may use for the improvement of its roads the unemployed sums produced by the ordinary revenue of the Province. Either from these sums or from the product of the loans, the Government gives to the municipalities which conform to the law sufficient grants to enable them to pay the cost of their work of macadamizing and gravelling. On the sums which the municipalities so receive they are required to pay only 2 per cent. interest for 41 years. The balance of the interest and sinking fund are paid by the Government.

The municipalities which avail themselves of the Law of 1912 are not allowed to benefit at the same time by the Law of 1911, except for the maintenance of their roads; which maintenance always gives them a right to the subsidy guaranteed by the Law of 1911. No payment is made to a municipality before it has transmitted a series of 41 coupons to the Government representing 41 payments of interest on the sum granted.

Under the provisions of the Law of 1912, as under the provisions of that of 1911, no macadam, stonework or gravelling is undertaken without the passing of a by-law containing specifications of the work to be done. A municipality desiring

to profit by this law first sends a petition to the Minister of Roads asking to be admitted as a beneficiary of the law. Upon receipt of this petition, we send an inspector to make a report on the work to be done on the roads to be macadamized, gravelled or stoned. This report mentions the parts to be raised, lowered, or repaired, as well as the bridges and culverts to be renewed, provided that these bridges and culverts have less than 8 feet span. (As I have already mentioned, the straightening and lowering of roads and the building of embankments done by municipalities are rather limited and not of such importance as the works done under these heads on Provincial roads.) The specifications prepared by the engineers are based on the report of the inspector. The specifications having been prepared, they are sent to the municipal council with a by-law fully framed. This by-law is voted by the municipal council itself and is not subject to the approval of the ratepayers; but I may remark that, upon several occasions since the Law of 1912 came into force, certain by-laws thus adopted by municipal councils have met with opposition on the part of some of the ratepayers. These ratepayers have petitioned the Government against the enforcement of the by-law. The Government has invited them to come and give their reasons before the Ministers in Council. They were thus placed by the Government in a position to combat a measure which their municipal council had a right to pass without consulting them. However, both parties in these cases are always allowed to come and plead their respective causes. The by-law of which I have been speaking is not exactly the agreement which binds the municipalities to the Government in regard to the payment of the 2 per cent. interest during 41 years. This engagement is made by means of a special resolution, the formula of which is furnished by the Government, and is adopted by the municipal council after its by-law has been approved by the Road Department.

The Good Roads Law of 1912 operates, so to speak, independently of the Municipal Code, save insofar as it is completed by the provisions of this Code. I mean that under whatever system the roads are maintained in a municipality, whether they are in charge of the corporation or in charge of certain ratepayers, the corporation may always profit by the Good Roads Law of 1912 and may bind all the taxpayers to pay the 2 per cent. interest. On the other hand, if the corporation does not wish to do anything, a certain number of taxpayers may benefit by the law, by presenting a petition to this effect and by pledging themselves to pay the interest. The 1912 Good Roads Law applies to county as well as to local corporations.

The Government is authorized to employ a part of the proceeds of the loans for the construction of highways between large centres of population. The total cost of this construction is paid by the Government, but the latter has the right to exact such contributions as it considers fair from the municipalities through which this highway passes. The municipalities which desire to offer a contribution to the work may do so by a simple resolution, which naturally need not be submitted to the ratepayers. Up to the present time the contribution exacted by the Government is $1,000 per mile for macadamized roads, and $300 per mile for gravelled roads. As I have already said, the average cost per mile of macadamizing and of gravelling Provincial roads cannot be compared with the average cost of these works when they are done by municipalities. Because of the importance of these great ways of communication, the Government is particularly careful to locate them in such a manner as to avoid, as far as possible, both steep inclines and dangerous curves. This involves rather considerable expenditure for the payment

of indemnities, purchases of land, etc. On the other hand, certain bridges of eight feet span and over have to be built by the Government, because of the insufficient resources of those who maintain them, and especially in view of the impossibility of exacting from them the additional expenditure, which would not have been necessary except for the construction of a road of such importance.

The application of the Law of 1912, both to the macadamizing and gravelling done by municipalities and to the construction of Provincial roads, is subject to the approval of the Lieutenant-Governor in Council. In this it differs from the Law of 1911, which is applied at the discretion of the Minister of Roads.

The above statements and explanations show, I think, that our aim has been not to make laws to satisfy the special requirements of certain localities or districts, but to popularize in the Province the idea of the general improvement of roads. For a number of years past the farmer of the Province of Quebec has been providing himself with all sorts of agricultural implements to reduce manual labour, which is constantly growing scarcer and scarcer. He has often added certain articles of luxury to the rolling stock of his farm, for which nobody can blame him, so long as he had the means to procure them. It is nevertheless evident that in looking for contributing factors to his comfort, he forgot one of the most important, that is to say a good road. It has been necessary to remind him of it. It has been necessary to accustom him to regard a good road as an object of as great importance as the mechanical reaper or binder. From this point of view, I think that the spirit of our road-making laws corresponds perfectly with the existing state of things, and is sufficient to bring about desired conditions. We have desired above everything else to instruct, and we believe that this is still the most rational way of developing new ideas in a country. If we had limited the application of new ideas to isolated constructions, important in themselves but restricted in their utility, we should surely have contributed to the leaving of some portion of the Province in a condition of complete ignorance and deplorable deprivation, from the standpoint of modern life and welfare.

In submitting our laws to the appreciation of the members of this Convention, I certainly do not fear a condemnation; nor yet do I look for unreserved approval. I shall be happy if this description of them has been found of any interest, and even if it leads to criticism which may prove profitable to us. In fact, we have come here to learn. To us, who are responsible for the diffusion of new ideas, it is a duty to exchange our own views and to filter, so to speak, by discussion, the new ideas which we desire to communicate to the masses. It is for you, gentlemen, to say how far this Convention may be useful, and how proud we are to see it so brilliant a success. We were sure of this success because of the reception accorded the proposal by the highest authorities. Your attendance has justified our expectations, and, if the President will permit me, I will add my own thanks and my congratulations to those which you have already received.

A Delegate: Mr. Bowman advocates the "pay as you go" system for permanent roadways. Probably he is aware that there are a great number of tenants on the farms in the Province who are only there for probably one or two years. Would it not be a hardship on these men to have to pay for a system of Good Roads for which they would only receive the benefit for one or two years?

Mr. Bowman: You must remember that your payment for Good Roads will continue. Don't think that because you build a road it is done forever. The trouble in most cases is that they start to build permanent roads and think that is all they will have to do. There is no such thing as a permanent road; you will

always have payments to make for upkeep and repairs unless we get flying machines, and that will be some time in the future. You will have payments to make on Good Roads just the same as we have at the present time.

THE CHAIRMAN: Mr. Michaud in his address was very modest, seeing that his Department has spent between $10,000,000 and $15,000,000. If every Province would make a vote of ten to fifteen millions there would be very little necessity for a Good Roads Convention, and what we would require would be a Convention for the maintenance of Good Roads. Mr. Michaud's Department is a very important one; he has it well in hand and he is a good worker. (Applause.)

DISCUSSION.

J. F. BEAM, ESQ.

As the Good Roads problem is so many-sided, I desire to speak more particularly of the two paramount or fundamental features of a just and therefore a successful and workable Road Law, as all the other features of such a law, although important, are secondary and comparatively matters of detail that are sure to follow once the two indispensable principles in such Road Law are secured.

The one matter then of the very first importance before complete success can possibly be obtained is the just assessment and taxation of all wealth in the Province. The magical effect of its justice will at once dispel all opposition and bring about universal success in the road reform movement, not only in some, but in all the counties and townships throughout the whole Province. Of course this result must not be expected to come too rapidly, but be gradually brought about as ways and means can be afforded, thus making one complete standard system, of the earth road for the townships, of the main market stone road for the county, and of the through-route Provincial boulevard. In confirmation of this statement I need only ask you to compare the Road Laws of Ontario, including our methods of assessment and taxation whereby the enormous wealth of railways nnd other corporations escape just taxation with the more just Road Laws, including a modern system of taxation, in the more advanced States and Provinces where the greatest success has been attained in the building of hard roads. This result is solely because every citizen in city or country is required to contribute to their cost, according to his wealth and ability to pay. There, too, it will be found that all opposition from farmers and others has long since vanished, simply because their Road Law has distributed the burden of cost not on a part, but on the whole wealth of the State.

Once a really just method of taxation is enacted in Ontario, as part of the Road Law, it will doubtless act as a powerful lodestone in uniting all classes, until everyone will see and feel that everybody has a common interest in the improvement of the common road upon which the advancement of civilization itself depends. The farmers who have been strong opponents will then be found clamouring for more hard roads faster than they can be built. This has been the case in all leading States since they adopted the more advanced methods of assessment and taxation. When the rich man and the rich tax-dodging corporations are required to pay their rightful share of the road tax, it will so lighten this burden on everyone as to be scarcely felt, and all opposition to hard roads on account of their great cost will naturally cease. The sense of justice that everyone will feel from the knowledge that those most able to pay are not escaping as formerly will cause everyone to pay his share of the road tax more cheerfully and voluntarily.

Mr. George C. Diehl, C.E., of Buffalo, N.Y., told us at one of our Road Conventions a few years ago that 95 per cent. of the hundred millions State aid for Good Roads was contributed by the cities of New York and Buffalo. This plan lightens the road tax burden on the agricultural industry. Living near the border I have frequently attended Road Conventions in Buffalo, and have found that the farmers of New York State make no objections to paying their comparatively light road tax, although the most substantial and costly roads were being constructed in that State. As soon as it was found that the farmers did not have the money to build the costly roads required, the New York Road Law was so changed as to place the road tax burden, not on the farmers as formerly, but on the whole wealth of the State, which is always found to be concentrated in the cities. A similar course must be pursued in Ontario to relieve the rural districts, which have not the necessary money to build the roads required, but which the cities have. Mr. Diehl also told us that the State of New York issued fifty year State bonds, which at that time were selling at 3 per cent. with a premium. The proceeds of these bonds with the premium were available at the same rate in every county and township of the State to pay their share of hard roads and thus greatly to reduce the interest charge. Over eight million dollars railway tax is collected in New York State, averaging $800.00 per mile of track, and also yearly three millions mortgage tax, the bulk of which goes to lighten municipal taxation. Can there be any doubt but that a great impetus would be given to the building of hard roads in Ontario if similar just features of taxation were embodied in the Ontario Road Law?

To show the injustice of our system of taxation, I need cite but one instance out of many. In my Township of Bertie there are fifty miles of railway, worth (at $50,000 per mile) $2,500,000, yet the law prevents the township from collecting but $236—only about $5 per mile in municipal taxation, railways being assessed not according to their real value but by the acre, the same as farm lands adjoining. In New York State, just across the Niagara River, on the same line of railway such tax at $800 per mile would amount to $40,000. The Michigan Central Railway running across Southern Ontario, since it has doubled its tracks and also doubled its value and capacity, still pays by the acre but $5 per mile to the township, instead of not less than $100 per mile as a municipal tax and 2 per cent. to 3 per cent. on its gross earning as a Provincial tax besides.

The whole question of just taxation and all matters of detail relating to the road problem must be submitted not to inexperienced men but to a Highway Board of experts and able men to prepare a just code of Road Laws for adoption by the Legislature. The second matter of the very first importance is that this up-to-date Road Law must have as its head a Provincial Highway Board composed of men with the energy and ability of a Sir Adam Beck, who will take hold of the road problem as their life work. This Board must be fully clothed with authority like the Hydro-Electric and Dominion Railway Boards to settle all disputes and the thousand and one matters requiring judicial decision. Other duties of this board would be to direct, control, and justly administer the Road Law in all its details; to regulate all traffic upon all roads in the Province; to collect license fees from automobiles for road repairs; to guard the public interests from wasteful expenditure of public funds on roads wrongly chosen by local council men who are temporarily in power for private, not public ends; and to see that the millions for hard roads are judiciously expended on the most direct market roads or on through inter-town routes, on the principle of the greatest good to the greatest number.

The selection of the right roads to be improved by Provincial aid is one of the most important matters for such a Board to control and decide. Mr. Jupp, Road Engineer of Simcoe County, stated at the Convention some years ago—at the time my resolution for the appointment of a Highway Board was adopted and to which there were some objections—that some sixty miles of County Roads were wrongly placed and public funds spend upon them that were not justified and which a Highway Board, not merely an advisory one, but one with a just exercise of power, would have prevented. Doubtless there has been similar experience in other counties. $1,000.00 per mile could have been saved the first two years in Welland County Road expenditure by a Highway Board simply preventing the wasteful methods employed. The local council must not receive the whole blame for this, or the many other mistakes through mismanagement, as it is all on account of our out-of-date and obsolete Road Law. The Council refused to employ an experienced superintendent from outside the county. After nearly two weeks' deadlock in the Council, costing over $100 per day, they gave their patronage to three inexperienced local men who took charge of the three machinery outfits, which were scattered as widely as possible, twenty miles or more apart. The scheme was to build short pieces of good roads in many places, even if this did greatly increase the cost. Not less than one hundred miles of stone road, it was declared, must be built the first year, with the idea, it appeared, of insuring the re-election of the promoters. Great disappointment followed when less than five miles of stone road in widely scattered patches were actually completed the first year, and a number of councilmen failed to obtain re-election. Mr. McLean, Provincial Engineer of Highways, as well as myself, advised that the road work should be concentrated, first along one main road and then along another, as is the rule in the United States, where the road problem has been more fully worked out by experience, thus greatly to reduce the cost of operating as well as of shipping or moving material and machinery to so many different points. But this being merely "advisory" advice, it was unheeded. After two years of such mismanagement and only some ten miles of stone road built, the Council at last, if not at first, saw the wisdom of securing an experienced road builder, even if he did happen to be located outside of the county, which they did in the person of Major Sheppard, Queenston. Under his better management more than double the mileage of stone road was built the past year than formerly.

After a long, long twenty years of waiting, a report on Public Roads by a Government Commission has appeared, recommending a thirty million dollars road scheme. Such a report should have been issued over twenty years ago, as the very first step in the Good Roads movement. I have read this report with deep interest and the proposition meets with my hearty approval, with one most vital exception to be explained later.

How did that foremost State, Massachusetts, which has the best built system of highways in America, take hold of the Good Roads problem? It was undertaken by the ablest men of the State as a Government proposition, through a board of able expert road builders. In all countries, ancient and modern, that have built the best and most extensive road systems, as history shows, the strong hand of the Government itself has taken hold of this transportation problem, considering it of the very first importance to the welfare of the people and advancement of the nation. In 1893 the Legislature of Massachusetts appointed a Highway Commission as the first step. In 1893 their report on Public Roads and Road Laws was adopted by the Legislature. That able Highway Board and its successors have re-

mained ever since in absolute control, with full authority to administer the whole road problem and to suggest all needed changes in the Road Laws. I obtained a copy of that report at that time when the first Ontario Good Roads Association was formed, in the winter of 1893-4, and then urged the appointment of a Highway Board in Ontario to make a similar report as the very first step, and urging at the same time that a large grant of Government aid be given for Good Roads.

I may say, therefore, as the proposed plan of thirty million expenditure on roads is in the main in accordance with the platform of the Good Roads Association which I have had a hand in making, I welcome this report and approve in general of the plan presented. Although long deferred, it is at last an important step forward, provided there is no further delay in putting it into force. Yet, on reading this report, so replete with valuable information, as are all reports that Mr. W. A. McLean has a hand in compiling, and with all due respect for the members of this able Commission, whose opinions are entitled to great weight, I must say I felt not a little disappointed on finding that this Commission had failed to hew to the line—although in this one respect only—in recommending, not an executive board of expert road builders to administer the thirty million expenditure without which their plan will fall to pieces, but a Highway Board, it appears, of three men to be appointed to give advice to the Minister, and to do all this without salary. It is not to the Minister that the advice would need to be given, if the vital part in this plan is not amended, but out in the counties and townships to the army of new and untried men seeking preferment in the local councils, to prevent a foot-ball strife over the selecting of highways for the thirty millions expenditure as that proposal now stands without any effective Executive Head. If the proposed large expenditure goes at loose ends in the country districts without regard to a well-matured plan to cover the whole Province, which should be carefully prepared and carried out by an able Executive Head, the blame must not be placed on the local councils, but higher up on those who failed to make just and effective Road Laws.

I beg, therefore, to suggest that this one serious defect in the plan be amended by appointing not merely an Advisory Board, although there can be no objection to abundance of advice, but an energetic Highway Board to hold the plan together and make it workable; this Board to be composed of three men appointed solely on account of their fitness as administrators and expert knowledge of the road problem. The hard work that will certainly be required of them will entitle them to a just remuneration for valuable services performed. Such a body will be able to save tens of thousands of dollars by wise and economic outlay of the large road funds. The whole Good Roads problem, to get the best, most economical and lasting results from the outlay, must be put into the hands of expert civil engineers, as has been done in all the more advanced States, and the sooner that is done in Ontario the better.

ADDRESS.

J. W. Levesque, Esq., M.P.P., Laval, P.Q.

Mr. Chairman and Gentlemen:

My first word will be to ask you to be indulgent, because I do not speak English very much. I hope this Convention will be a great success and that each member will go home from it with the intention of working hard to get Good Roads for his Province and for his district.

As far as I can see, the people of the Province of Ontario, like the people of the Province of Quebec, are afraid of the taxes. I would like to say to the members of municipal councils who are present here to-day—"Don't be afraid to tax the farmers for Good Roads, because if the roads are good they will be satisfied to pay the taxes." In my county of Laval, which is near Montreal, the municipal authorities passed a Good Roads By-Law without submitting it to the people. Many people were against it. My own friends were against it. They said "Mr. Levesque, if you pass that by-law, we will defeat you at the next election. We do not want so much money spent on our roads." I said to myself, They are intelligent, and when the roads are built they will be satisfied. We built our roads, and last fall the Minister of Good Roads and many people from Montreal came there to see them, and they were satisfied, and everyone was in favour of Good Roads. It was not a political question, but it was a national question. (Applause.)

I think we have given enough money to railways in this country. We have voted hundreds of millions of dollars to the railway companies, and these companies are paying dividends. The farmers of this country have paid a great deal of money for the construction of these railways, and it seems to me that it is time to do something now for the farmers.

The farmers think we are building Good Roads for the benefit of those who run automobiles. In the Province of Quebec, we have passed a law that the license paid by owners of automobiles shall not go to the Provincial Treasury, but to the Good Roads Department. (Applause.) The license paid for automobiles is employed exclusively for the building and maintenance of Good Roads in our Province, and the farmers are glad when they see the number of automobiles increasing, because that means that the revenue for Good Roads is increasing and that the charge to the farmer is decreasing, because the money goes to the corporations for the building and maintenance of our roads.

Mr. Bowman spoke of the Federal campaign for Good Roads. We are in favour of that, and we hope the Federal Government, whether Liberal or Conservative, will give the Provinces justice, and will grant us all the money we need to build these roads. What everybody wishes and what we want is that the money shall be divided amongst the provinces according to population. Ontario, having the largest population in the Dominion, will get the largest part of the money, and we in Quebec have no objection to that. We have the second position and we will take the second share. We do not want the money to be submitted to any political party. We want that money to be divided justly according to population, and that is the only way to divide it, honestly and fairly. (Applause.)

Now, Mr. Chairman, at the last meeting of the Association we decided on the construction of National roads. Someone has said Interprovincial roads. I will go further and say we should have a National road, between Montreal and Toronto, and from Toronto to Windsor. We want such a road to unite the great Provinces of Ontario and Quebec. That road should be built from Quebec to Montreal, from Montreal to Ottawa, and from Montreal to Toronto and Windsor. That road should be built within a very short time. That is the best way to create good relations between these two Provinces, the two largest Provinces of the Dominion. The people of these two Provinces will get better acquainted and will understand one another better and work together for the prospertiy of this great Dominion.

We have voted five million dollars more in the province of Quebec, making altogether $15,000,000. We expended last year and the year before in my county

about $600,000 and we will soon reach the million-dollar mark. We have built asphalt and concrete roads. We have a very fine concrete road running from Montreal. In the beginning many farmers were against it because they said it would be hard on the horses' feet, but now the road is built all the farmers prefer to use it, because they can take a double load to the market. On Sunday from 300 to 500 automobiles pass over this road, and everyone is satisfied. When the work of road-building is well done, under the supervision of the Provincial Department of Good Roads, everybody is satisfied, the farmers pay their taxes and nobody grumbles. The trouble now is, that the municipality wants to go ahead too quickly. In my county there are three municipalities which were against Good Roads, but now every Sunday afternoon they come to my place and ask me to go to Quebec and get money to build Good Roads in these municipalities. Last fall one farmer told me that he was against it, but now when the road is finished they are able to come to church even if it rains for several days before, and this farmer told me, "It is a good thing for you that we have Good Roads, and although it rained last night the roads are better than they were yesterday; there is no dust and everybody is satisfied. Now when we go to the market we can take double the load we did in the old days." And he also says, "Do you know, our horses, now that we have Good Roads, run faster and they are satisfied, but as soon as they reach bad roads they stop. We try to force them to go a little quicker, but they refuse. They seem to tell the farmers, 'Build Good Roads and we will go faster.'" (Applause.) In the Province of Ontario, with the intelligent population that you have here, it is very easy to convince them that the construction of Good Roads is the best thing for the farmers. Good Roads are not only for the automobile owners. I have no automobile, neither have I a horse. I say to the farmers, "If you are afraid these roads are only for automobiles, increase the license for automobiles and put the money in the Treasury for the construction and maintenance of Good Roads." That is the only way to bring the farmers to the realization that Good Roads are absolutely necessary.

My heart is with you and I thank you for your kind attention, and for the honour you have conferred upon me. This is the first time I have ever spoken English in giving an address before a public audience. (Applause.) I can assure you that when my children come to Ontario they will talk as good English as French, because we have good schools in our Province and everybody speaks French and English. We must speak both French and English, that is the best way to understand each other. (Applause.)

THE CHAIRMAN:—I told you that Mr. Levesque was quite enthusiastic over Good Roads. I am sure that his visit from the Province of Quebec will do a lot of good to cement good feeling between the Provinces. They say when an Englishman gets hold of a French word he believes it is one of his own. One day at a dinner an Englishman turned to a Frenchman who was sitting next to him and said, "What word have you in French for 'Entente Cordiale'?" (Laughter.) This Englishman had come to believe that it was his own word. Good Roads lead to happiness, and we want them as fast as we can get them.

"BRIDGES AND CULVERTS."

Lucius E. Allen, Esq., Civil Engineer, Belleville, Ont.

Mr. Chairman and Gentlemen of the Convention:

Before introducing the question of bridges and culverts, I wish to congratulate the Convention on having present such men as Mr. Dandurand, Mr. Levesque and Mr. Michaud, who so enthusiastically presided at the first International Road Congress at Montreal. I had the very great pleasure of attending that Congress. I think it would be of great interest and benefit for those who are interested in Good Road work in the Province of Ontario to pay a visit to the Province of Quebec. Quebec is certainly doing her share in the matter of Good Roads, and it will certainly open the eyes of any man from Ontario to pay a visit to the Province of Quebec.

The important question of the development of a Good Roads system, which is now so prominently before the country, necessarily includes that of the construction of good bridges and culverts. Since a good road as a whole is only as perfect as its weakest point, it is obvious that a poorly constructed bridge, as an integral part of such road, determines its degree of perfection. It is therefore extremely essential in considering the construction or improvement of our public highways carefully to watch the construction of our bridges and culverts. It would be impossible in the time at my disposal to enter into a detailed treatment or discussion of bridge construction, and I will therefore refer to some of the general features which suggest themselves to me in connection with the carrying out of a general scheme of bridge construction in counties or townships.

It may be of interest briefly to trace the development in bridge construction during the past fifty years, especially the kinds of materials that have been, and at the present time are being, used in the construction of bridges. When this country was first settled, and even until quite recently, wood was the most available and commonly used material for building bridges. Wooden bridges of various types were constructed, and many are still in use. Traffic conditions at that time did not require as strongly constructed bridges as at present, and the old wooden bridges served their purpose as well as any other material.

Some twenty-five years ago the use of iron, in combination with wood and otherwise, came into use, iron having become cheaper in price and more available as well as more adaptable for heavier bridge construction. The most common type of iron bridges are the simple girder and pin-connected trusses, with all-wood floor systems. It was not, however, until about the year 1875 that steel as a bridge material came into use, and then only in heavy or long-span bridges. As the manufacture of steel was rapidly developed and cheapened, its use as a material for bridges rapidly increased, and to its use credit must be given for the construction of some of our largest and most important bridge structures. At the present time, steel forms the principal material entering into the construction of a large number of our bridges.

The use of cement or concrete as a bridge material, while of almost ancient origin, it having been used by the ancient Romans, did not come into general use until some years ago. Plain concrete arch bridges were constructed in France nearly fifty years ago, and are still in good condition. Within the past fifteen years, however, the use of concrete reinforced with steel has rapidly developed into one of the most flexible and permanent materials yet discovered for bridge construction and, while not adapted to all locations or conditions, must be considered one of the most important factors in modern bridge development.

It is not desirable at this time to enter into an explanation or discussion of the theory or technic of designing either steel or reinforced concrete bridges, but rather to refer to some of the general and practical features of the subject, which are almost daily presented to our municipalities. Returning to our first axiom, that an improved highway is as perfect as its weakest part, is it not essential in considering any highway improvement to make a careful study of the traffic and general requirements in connection with that highway, including as a component part the bridges and culverts? It therefore seems essential in carrying out any general or special highway improvement work to adopt first some general plan of handling the work projected. This rule should apply equally as well to the construction of a system of permanent bridges in a township or county, but a systematic survey of all the existing bridges and important culverts in the municipality should first be made. Such a survey, I would suggest, should cover the following points:—

1. A complete list of all bridges and important culverts in the municipality, giving the name of each bridge; its location; type of construction; character of river or stream; foundation conditions; present condition; when last painted or repaired; and rating.

2. A classification and rating of such bridges, based on amount and character of traffic conditions.

3. The embodying of all this information into a general report to the council of the municipality, with such recommendations as may be thought necessary in dealing with the question.

4. An inspection of all bridges and culverts and a revision of such original report each year thereafter.

While such a survey may appear to some to be a heavy task and not productive of sufficient merit to warrant the time and expense, yet, if once properly made, the future work of the municipality in this connection will be immeasurably lessened. From the data secured from such a survey and report, the total approximate cost of reconstructing a permanent bridge system in any county or township may be calculated; the name, type and location of those bridges most necessary immediately to reconstruct, together with estimates of cost, and the number and location of those bridges requiring repairs, painting, etc., can all be presented in a definite and intelligent manner.

Too much stress cannot be placed on the responsibility of municipal councils in allowing old and unsafe bridge structures to remain until accidents or loss of life and property occur, and if a general and annual "stock taking" in the way of a general bridge survey and report be made available each year to the public, the tendency to delay the necessary reconstruction of old and unsafe bridges and culverts would be reduced to a minimum, and damage claims would disappear. That this question of responsibility has been brought to the attention of the authorities in other places may be evidenced by reference to a report issued by the United States Office of Public Roads of an inspection of the highways of the State of New Hampshire, in which Mr. Charles H. Hoyt, C.E., states as follows:—

"Attention is called especially to the condition of the numerous wooden culverts and bridges on the State road. . . . These culverts and bridges are subject to a large traffic through the summer season, and practically every one of them is unsafe. It seems that it would be a better policy to rebuild and replace these wooden deathtraps with reinforced concrete structures once for all time than to wait until some horrible accident has happened, resulting in the loss of

life and claims for heavy damages, which may amount to as much or more than the cost of concrete culverts, and then have to build such culverts after all these things have happened." These are strong words, but only reflect the true situation existing in many of our own counties and townships in Canada.

Assuming that a definite survey and bridge report of the condition and desired improvement of a given municipal bridge system has been prepared, the next step is to consider the best and most economical plan of carrying out the proposed work involved. The best plan to be adopted in any given municipality will largely depend on the extent and character of the bridges to be constructed. If the case be that of a large county or township, having a large number of bridges and culverts to be constructed, extending over a period of years, a county or township bridge construction force, organized and managed directly by the council through qualified officials, may carry out the work better and more economically than any other method.

Where a county has already organized a competent bridge construction force, it would be quite feasible for the county force to undertake, when requested by any township in that county, the construction of any bridges and culverts under township control, the actual cost of labour and materials for the township bridge work being charged against the township, thereby saving the township the initial cost of purchasing equipment and organizing a township construction force. Especially is this the case when most of the proposed work is of reinforced concrete construction. However, it must not be inferred that any less skill or care is required in building bridges of this type than of structural steel, many failures having been made by careless workmanship and poor design. If suitable machinery is provided, a careful selection made of materials such as gravel, sand or crushed stone, and competent foremen and workmen employed, excellent results should be obtained, and a large proportion of the money expenditure for labour and materials is thus distributed and returned to the ratepayers of the locality.

There also seems to be an increasing use in many countries of prison labour for work of this nature. One of the best examples of a large bridge constructed by prison labour is that of the Tempe Bridge in the State of Arizona. This bridge is an eleven-span arch-rib type of reinforced concrete, with eighteen-foot roadway, open spandrel walls and a total bridge length of 1,507 feet. In this work the State, as an incentive to the prisoners for good behaviour and efficient work, allowed each prisoner for each day employed on the bridge a credit of two days to be deducted from his sentence in addition to the usual good-conduct allowance. Possibly some of our German, Austrian and Turkish prisoners of war in Canada could be made useful in this way.

If bridge work in a municipality is not carried out directly under its own forces, but by public contract, the plans and specifications should be carefully prepared by the municipal engineer in accordance with the Government regulations, and close inspection of the work throughout should be made during construction and final completion. The submission to municipal councils of several different designs and plans with tenders by contractors tendering for bridge work, without their having been passed upon by a competent engineer, and which may or may not come up to the standard, has, thanks to the regulations enacted by the Department of Public Works of our Province, been largely relegated to the past.

As before stated, the decision as to the type of bridge to be built for a given locality, whether of steel or of reinforced concrete, will largely depend on local conditions. If steel construction is selected, the length of bridge may determine

whether a high truss or low truss or girder type is best adapted. The number of spans should be so governed in most cases that the total cost of the superstructure will be about equal to the total cost of the substructure or foundations.

In any case it is considered the best practice to put down a reinforced concrete floor slab. This will vary in thickness from 5 to 8 inches at the crown to from 4½ to 6 inches at the edge. The addition to the concrete mixture for bridge floors of a small percentage of high calcium hydrated lime will notably increase its density and durability. In long-span bridges it is also a good plan to spread on the finished floor surface a good covering of gravel, which in winter time serves to hold the snow better than a smooth surface, and in addition protects the concrete from excessive wear. A very noiseless and efficient floor covering may be obtained by the use of creosoted wood blocks. This will add from $2.50 to $3.50 per square yard to the cost of the floor system, but for cities and large bridges may be considered very desirable.

Most careful attention to the selection and application of protective coatings or bridge paints to steel bridges should be given, as the life of the bridge will largely depend on the thoroughness with which it is kept properly painted. Many steel bridges in this country are rapidly going to ruin for the lack of attention to proper painting both before and after erection.

That the intelligent use of reinforced concrete as a material for bridges and culverts has reached a high state of development needs no comment, and where there has been one failure, due to improper design or the use of poor materials, there are hundreds of satisfactory and permanent examples of reinforced concrete bridges and culverts, which are standing every condition required of them. Several points occurring to the writer in connection with this type of bridge construction, which have from experience been worth following, may be mentioned:—

1. Do not attempt the work because it looks easy. Skill, experience and care are required to secure good results.

2. Do not spare time and money in first selecting the best aggregate available—gravel, sand or crushed stone.

3. Do not use too lean concrete mixtures. Sufficient cement is more economical than poor work.

4. Do not slight the work of mixing and placing the concrete. This is often the cause of failure in a bridge.

5. Do not place the reinforcing steel carelessly, and see that every piece of steel is in its place.

6. Do not slight the form-work. Good carpentry work is essential to a well finished bridge.

7. Do not pour slabs, beams or arches when weather conditions are unfavourable, but when favourable push the work forward to make it as near a homogeneous monolith as possible.

8. Do not sacrifice strength and durability to beauty in either design or workmanship. A combination of both can be had without injury to either strength or artistic design.

9. Do not strip form-work too soon and allow traffic on the bridge until it is well cured. This has caused failure of many bridges, which otherwise would have been satisfactory.

10. Do not build bridges with too narrow roadways, or for too light loads. A reinforced concrete bridge should be built to serve future as well as present requirements.

The construction of culverts is very closely allied to that of bridges, and in general the same principles apply. A bridge less than ten feet clear span may be considered a culvert. The best type of construction to use for any particular culvert will depend on local conditions. The height may be such that a reinforced concrete slab resting on two abutments may be the better type to use. Many small culverts are being built by the use of collapsible steel forms which may be removed quite easily. Where the foundations are not of the best, a continuous base upon which the abutments may rest may be used to advantage. If it is thought that scouring will take place, a concrete tie foundation wall connecting the two abutments should be carried down and transversely with the culvert to such a depth as will prevent under-washing. Reinforced concrete tile can now be manufactured in large sizes, and in many cases may be made use of in the construction of permanent culverts. They should be carefully laid and bedded, the joints being well cemented and finally covered to a sufficient depth. All-metal culverts of galvanized iron are also used in many localities, but if conditions are favourable for putting down concrete culverts, they are no doubt more permanent than metal.

The naming and marking of all important bridges is a small detail, but will add to the convenience in inspecting, reporting and locating any particular bridge for all time. A bridge plate which has been adopted in Hastings County, a sample of which is shown, costs the county $5.00 per pair, and one plate is placed on each right-hand end post of every reinforced concrete bridge constructed. They are made of bronze, and make a permanent marker.

In considering the construction of bridges, as in the building of roads, the old proverb may well be applied, that a good bridge is "a thing of beauty" and "a joy forever."

DISCUSSION.

NORMAN M. MCLEOD, ESQ., CIVIL ENGINEER, TORONTO.

Mr. Chairman and Gentlemen:

When Mr. McLean invited me to speak at this Congress, I was pleased to accept his invitation; I very much regret his illness. About two days ago I got a letter from an enterprising technical weekly which said, "We see from the programme that you are to lead the discussion on concrete bridges. What are you going to say?" They had as good an idea about that as I had. However, I came to the conclusion, before hearing Mr. Allen's paper, that a few remarks on the floor of a bridge might not be amiss. I listened to Mr. Allen's paper with great interest. It touched upon that point, but with his permission I would like to elaborate on it a little.

The floor of a bridge, or that part of it through which the principal loads to which the structure is to be subjected are transmitted, how often it bears the stamp of being an afterthought, a "good enough"! I have in mind at the moment a series of crossings of one of our most important streams close to the limits of a large city, whereon a wave of floor boards precedes your motor and a wave follows it, with a rattle and a bang that causes the comparatively modern steel work to vibrate and rattle, while the street sweepings and rotted wood are washed by every rain-storm to add to the damp soggy mass, lodged in some pocket on the bottom chord or shoes, to help along the work of destruction.

As very concisely set out in a resolution passed by the Third International Road Congress at London in 1913, " the choice of road surfacing for bridges depends on the nature and intensity of the traffic, the local conditions, such as permissible first cost, kind of material readily available, and climate." For light bridges the choice is largely influenced by the weight of the surfacing. Public safety and convenience should, however, first be regarded, rather than the question of comparative cost. The weight of the steel work outside of the bracing and handrail of a highway bridge is increased, by increasing the weight of the floor, approximately in the ratio of the increase of floor load to the sum of the dead load, live loads and impact, when using specifications in which the impact is not a function of the dead or floor load; with others, as the Dominion Government and Ontario Highway Specifications, any increase in the dead load will reduce the impact and therefore the percentage of increase will be somewhat smaller than that cited. There are, however, so many variables in discussions of this nature that it is impossible to do anything but generalize.

While it is desirable, especially on short bridges, that the surfacing should be the same as in the adjoining streets or roads, impermeability and smoothness of surface must also be kept in mind. The C.P.R. Irrigation officials near Calgary have, I understand, recently carried out some highly satisfactory experiments with highway spans up to 125 feet, on which they used a reinforced concrete slab with side retaining walls for a subfloor, carrying a dirt roadway to correspond with the surrounding roads. This continuity of surface, in addition to its obvious advantage to traffic, has the added advantage that maintenance is simplified in that there is always the same material at hand as in the road. In the case of a very long bridge, which approaching vehicles can see and are prepared for, the continuity of surface is, perhaps, not so important.

Amongst other important points to be considered in designing a bridge floor, perhaps the most important is that of drainage. Surface water and refuse from the highway must be kept away from the structure proper, whether it be of steel, concrete or masonry. The floor should, if possible, be waterproof—preferably fireproof—capable of resistance to wear, durable, as smooth as possible, without being slippery and, needless to say, of a weight appropriate to the structure of the bridge.

The types of subfloor usually met with are either plank, steel plate—either buckle or some form of trough plate—or a reinforced concrete slab. The plank is light and cheap in first cost; its life, however, is short and the risk of loss by fire is great. It should not be used except where the wearing surface is also plank, in remote districts where a more desirable form of floor is not readily obtainable. When plank subfloors are used, creosoting of the plank will more than pay for itself. Steel plates will require attention from time to time, and should be covered with a heavy coat of some efficient waterproofing material. While the concrete slab is practically indestructible, it has, of course, the disadvantage of weight.

Of the surfacing materials ordinarily used other than plank, creosoted wood block has the most advantages, it being light, durable and presenting an excellent surface in every way for traffic. Special care must, however, be taken in the selection of treatment and laying, to avoid troubles due to the expansion or contraction of the blocks or the metal work of the structure. On one rather large structure paved with wood blocks that I was connected with, the designers were at great pains to specify a heavy piece of creosoted 6 in. x 8 in. timber between the steel retaining frame, which rose to the surface of the roadway at each expansion joint; and the first row of blocks, the timber being laid on its flat, quickly wore hollow under traffic, with rather disastrous results to the road surface.

Macadam, or ordinary broken stone surfacing, is not always satisfactory, not only on account of its great weight, but its permeability. The subfloor must be heavily damp-proofed when it is used. Tarbound macadam is better. Asphalt in its various forms makes a good surfacing material for bridges on which the roadway is wide enough so as not to confine the traffic to definite lines.

For movable bridges, the weight of the paving is a more important factor, and in this connection I have been much interested in an account of some European experiments, in which they have used old Manila mine cables, laying them longitudinally of the bridge, close packed to one another, and then saturating them with a preparation of coal tar or, in some cases, asphaltic material. This makes an excellent wearing surface, with the advantage of extremely light weight, and moreover practically noiseless.

DISCUSSION.

FRANK BARBER, ESQ., YORK COUNTY ENGINEER, TORONTO.

Engineers who carefully examine bridges throughout this Province will not fail to see that they exhibit local characteristics; in fact one may often tell the locality of a bridge from a photograph. I think that some local customs might be changed for the better, without increasing the cost. Improvements are possible, not only in the bridge proper, but also in such cognate things as bridge approaches and the containing banks of the stream in the immediate vicinity of the bridge. These are really essential parts of the bridge, though I know as a fact that many builders pay little or no attention to them. As an example of what I mean, I have often seen clay covered with boulders underneath the superstructure and between the abutments of the bridge, heaped up, either by nature or otherwise, so that the surface rises above the surface of low-water level. This, of course, hampers the waterway at the time of freshet. Perhaps it may be said that extra waterway is not required to take care of freshets. If that is so, a shorter span might have been used by taking this material away. Undoubtedly it will be found that it is cheaper to provide a waterway by cleaning out this material under the bridge so that low water will wash both the abutments, than to increase the span of the bridge. In many municipalities the practice of building almost everything about bridges, both superstructure and substructure, has been improved very greatly in the last generation, with the exception of bridge approaches, and these are often built in the same way that our grandfathers used to build them. For instance, wooden floors on steel bridges have been almost entirely replaced in favour of concrete, but wooden posts for approach fences are still common. It seems strange to me that some more permanent material has not been found for posts, because almost the least favourable position in which wood can be used is where it is partly covered with earth, as fence posts are.

I therefore propose to speak, Mr. Chairman, for a few minutes on bridge approaches and with regard to approach fencing. Concrete posts with either concrete or gas-pipe railing have been found to give satisfaction. Where approach fences are built on new fills, each pair of posts should be wired together across and underneath the fill to prevent the fence from spreading and leaning when the fill settles. If concrete posts are used, in order to prevent them from settling down with the fill, the posts should rest upon the old earth, or, if the new fill is too high

for this, the concrete posts should rest upon wooden blocks which rest upon the old bed. It is convenient for this purpose to allow the contractor to use the timbers from the old wooden bridge, if there are any.

As to the width of bridges and approaches, you know that it will cost ten times as much to widen the floor of a steel or concrete bridge as to widen the earth approaching to it, and yet no doubt you have seen bridges with 16-foot roadways which have approaches leading to them not wider than 12 feet. This is not consistent. I believe it is good practice to make the approaches a little wider in general than the bridge proper. The most usual width for bridges in Ontario, carrying ordinary country highway traffic, is 16 feet clear between the rails. That is supposed to be the least width upon which two vehicles can conveniently pass. I believe this is a popular error, because I have observed that drivers will not ordinarily pass on a 16-foot bridge. I admit it can be done, but why put extra money into widening a bridge when people will not generally use it for the purpose for which it is intended? I suggest that for very small traffic the width adopted should be 14 feet. I believe nothing less will accommodate certain kinds of farm machinery. Where the floor of a bridge is meant to be just wide enough for vehicles to pass easily, it should be 18 feet wide.

The side slope on earth approaches should not be steeper than 1½ horizontal to 1 vertical. Such easy slopes will become permanent with comparatively little attention. Steeper slopes than this will become rotted with rains and will require very frequent attention and repairs. I suppose, if there were any railway engineers present, they might think it superfluous to mention these things, because it is almost universally the practice to make proper slopes in railway construction, but it is the exception in the highways in this Province. The reason so many steep slopes are used on fills is partly from false economy, with the idea of lessening the amount of earth required. To show you how little saving there is in first cost in this scamping of material, I will give you this example: For a fill 100 feet long and an average of 7½ feet high, about 100 cubic yards of earth more will be required to make proper side slopes of 1½ to 1 than to make slopes of 1 to 1, which is about the steepest which should be made. The difference is only about $30.00. You can judge for yourselves as to how far $30.00 will go in repairing 100 feet of fill of this depth.

It is difficult to arrive at the total cost of repairs that are made on bridge approaches and structures not built in a permanent manner. I inspected an old wooden beam bridge recently and every stick of it, with the exception of small parts of the abutment, bore evidence of having been placed in the bridge at different times after the original structure had been built, and some parts had no doubt been renewed a number of times. The committee in charge were not fully aware of this condition and did not know to what extent it had been repaired. They told me that this very bridge had been in use for about forty years, and it reminded me of the case of a jack-knife, which had had two new blades and afterwards a new handle, although the owner considered he still had the old knife.

It might be worth while to consider the advantages, in certain cases, of making the side slopes of fills even easier than 1½ to 1. Where the slopes are made 3 to 1, I have found that no approach fences are required. Because of such easy slopes as this, teams can drive out over the slope without any danger of overturning. The difference between the cost of a 3 to 1 slope and a 1½ to 1 on the fill 6 feet high is about 20 cents per lineal foot each side, which is about the same as of a wooden approach fence. On a fill 12 feet high the extra cost of these easy slopes would be

about the same as the cost of a good fence of concrete posts and 2-in. gas-pipe railing. We may conclude that eliminating the fences by easy slopes is not feasible for high fills, but for low fills it is not only cheaper in first cost, but it results in more handsome and more substantial and permanent bridge approaches. A 3 to 1 slope could not be used close to the abutment, because that would require the wing walls to be longer than is consistent with economy. Where recourse is had to easy slopes to save fences, the slopes at the wing walls should be 1½ to 1, gradually becoming less steep until a slope of 3 to 1 is obtained, at a distance of perhaps 20 feet from the abutment. It is often worth while to place old sod on the sides of cuts and fills. Where the slopes are merely seeded, there is considerable chance that large ruts will be formed by the rains before a good body is obtained, to say nothing of the fact that seeded slopes grow up ragged and contain weeds. Where slopes are surfaced by sod they become hard and permanent more quickly and soon look twenty years old. I learned this first from a farmer in the course of the construction of country bridges. Some of the people living near a bridge are sure to try to tell you how to build them. Ten years ago I was sometimes foolish enough to resent this, but I do not now. Sometimes I pick up a pointer, and this sodding of side slopes is one of the pointers I picked up in that way. Sodding costs a contractor an average of nine cents a square yard. To sod a fill 8 feet high and 50 feet long would thus cost less than $15.00, which is less than the cost of repairs that would be required on a fill of this extent.

The function of wing walls is to retain the approach fill. The tops of the wings should be built so as to conform with the fill at all points of the slope, so that concrete or masonry wings will not rise above the fill at any place. The higher the fill, the longer will be the wing wall required to contain it. It often happens that the height of the fill will be different as used from different quarters,—that is to say, the distance from the top of the fill to the natural ground might be different at one side of the fill than at the other side of the fill and, in a case like that, the wing walls of the approach should not be of the same length. Sometimes the proper length will differ considerably. The length and slopes of wings should, of course, be computed from the surface of the natural ground with the level. I have found that splay wing walls are most satisfactory when placed at an angle of 30 degrees to the face of the abutment. There would be less concrete in the wings if the wing walls were placed on a straight line with the face of the abutment, so as to come out close to the edge of the stream. Such wings as these are quite proper for subways, but where water has to be contended with, they are not practicable on account of the danger of the water getting around behind the ends of the wings. There is about 50 per cent. more concrete in 30-degree wings than in straight wings, but in the case of 30-degree wings each wing will be placed a distance of equal to half the length of the wing behind the face of the abutment and, presumably, that distance back from the edge of the stream, so that there will be little danger of a washout behind the wing. When the ends of the wings are placed still further back from the edge of the stream, the difference in the amount of concrete required to retain the fill is very noticeable. There is about 22 per cent. more concrete in wings that make an angle of 45 degrees with the face of the abutment than in wings that make an angle of 30 degrees. The principal of "U" wings is quite different from that of splay wings. Sometimes "U" wings are most economical. The higher the fill the longer will be the wings required to retain it, and so we find that it is best not to attempt to retain a high fill at all, but to let it take its natural slope. In this case, shore span piers will be used instead of abutments and wing walls. The

higher the fill the more economical are shore spans compared to wing walls. Sometimes shore spans are economical for fills 20 feet high, and nearly always for fills 25 feet and higher. The Angus bridge in Simcoe County will serve as an example. The amount of the span is 135 feet. The floor is 20 feet from the surface of the summer water level. We called for tenders on the concrete work of two designs, one for the ordinary abutment and splay wings, and the other for shore spans and piers. The shore span design was about 30 feet in the span. The lowest tender was for shore spans and was about $500 cheaper than the wing wall design.

Good use can be made on bridge approaches of field and river stone, as the natural riffraff, and of gutters to carry the rainwater down the side of the fill. Another use is to protect the fills from abrasion by freshets. I do not wish to go into particular specifications for dry walls further than to say that dry walls which contain earth fills should be carefully laid and inspected, and should never be laid on a slope steeper than 1 to 1. It might be worth while to mention that where the surface of a fill next to an abutment is completely covered with dry wall laid on a slope of one to one, there will be about one-third less concrete in the wing walls than where these wings have to retain an earth fill on a slope 1½ to 1. Where riffraff is exposed to heavy freshets, it might be worth while to pour thin concrete into the space between the stones after the riffraff is laid. I have found that about one-quarter of the bulk is concrete where that is done. For instance, in one case, 28 cubic yards of riffraff required 7 cubic yards of concrete to fill. In regard to this, local conditions must govern; if permanent approaches are to be built at moderate costs, each case must be considered by itself. I think that is as true of bridge approaches as in the main construction. I am sorry that I could not show you a few slides to illustrate what I mean. It is very difficult to explain these things without illustrating the different points. I trust that I have made myself understood, and I thank you, gentlemen, for your kind attention. (Applause.)

Machinery Exhibit.

FOURTH SESSION

Wednesday Morning, March 24th, 1915

LUCIUS E. ALLEN, ESQ., in the Chair.

THE CHAIRMAN: I have been asked to open the meeting this morning, and the first thing on the programme is an address by Mr. R. A. Meeker, State Highway Engineer, New Jersey. We have always heard of the large growth of mosquitoes in New Jersey, but we have also heard of the good roads. I understand that Mr. Meeker is considered the father of the Good Roads movement in that State, where they have some very fine roads. I am sure the Convention will be very pleased to hear from Mr. Meeker.

"STATE ROADS OF NEW JERSEY."

ROBERT A. MEEKER, ESQ., STATE HIGHWAY ENGINEER, TRENTON, NEW JERSEY.

Mr. Chairman and Gentlemen of the Convention:

I have been introduced as coming from the Mosquito State, but our mosquitoes are nothing like the flies you have around your maple groves, and possibly some of you know what they are like. Therefore you have my sincere condolences; we have our troubles in New Jersey, but I think you have yours also.

New Jersey is the oldest road-building State in the Union. It was the first State to grant aid to the counties and municipalities in the improving of their roads. The Act granting financial aid to the several counties was passed in 1891, but like all new laws it was not operative at first, and the law was amended in 1892, and the farmers of our State considered that Good Roads were something very necessary. Therefore the President of the State Board of Roads gave his services without pay, but in about a year he found that working for nothing and boarding himself was rather an expensive luxury, and therefore he declined to serve any longer, and in 1894 a Commissioner of Roads was regularly appointed. From that time to the present the road work in New Jersey has been carried forward under one Commissioner. Several attempts have been made to convert this Department into a Commission, but fortunately without success. Some of our good, hard-headed people say, "If you have three Commissioners, why don't you have three Presidents for a bank?" and therefore we think one is enough.

The first road built under State supervision was of plain macadam in the northern section of the State and of gravel in the southern. Our State is peculiarly blessed or cursed geologically: in the southern portion we have nothing but gravel, while in the northern we have the older rocks and also trap. For the first fifteen years these roads were satisfactory: then the increasing motor-driven traffic imposed a stress to heavy for them to withstand. This forced us to look for something that would meet the new requirements as cheaply as possible.

We first tried the so-called asphalt oils and tars. These were applied hot by means of an ordinary sprinkling wagon. This treatment stopped the ravelling of the surface which had caused so much unfavourable comment, but the results obtained were not uniform: some sections were very good while others were not so. This led to the practice of mixing the stone and bitumen before applying them to the surface. The results obtained by this method have been over ninety

per cent. good, whether the stone was heated before adding the bitumen to it or not. Weather conditions must be carefully considered, and the best results were obtained during warm, dry weather. This has led us to place such a restriction in our specifications and further to prohibit the laying of bituminous concrete before the 1st of May or after the 15th of October except by special permission. These dates may have to be changed in different sections of the country. Our rule is that no bituminous concrete is to be laid when the temperature falls below 50 degrees; otherwise the results are not satisfactory. If this precaution is not taken, the pavement is sure to become wavy, uneven, and often so porous that water enters and disintegrates it. The great object in the construction of bituminous and all other aggregate pavements is to reduce the voids to the least possible quantity and at the same time to make a pavement as nearly homogeneous as possible; that is, the pavement must be as dense as possible and the mineral aggregate must be uniform in size and evenly distributed through the entire mass.

That is something I would like to impress upon the minds of the members of this Convention. Unfortunately I noticed that your crusher men are not as careful in grading their rocks as we are in the States; we have learned by sad experience that it is very necessary that the stone should be uniform in size as well as in quality. To secure these results, the material must be carefully graded before it is mixed, must be evenly spread upon the road and uniformly compacted. As all of these factors are essential, it is very evident that the men employed not only in the mixing but also in the spreading and rolling of the material should be skilled in their work if the desired results are to be obtained. These remarks apply also to Portland cement concrete.

Unfortunately some of the apostles of Good Roads and of particular pavements have practically told you that this pavement or that is practically fool-proof: anybody can throw it on the road and it will be all right. Now that is a fallacy; it is just the same in road-building as in farming, as some of you know. Two men may have the same implements and the same soil, and one gets half a crop where the other man gets a full crop. No one pavement can be selected as the best for all places and all classes of traffic. The pavement to be used on a certain road must be designed to carry the present and prospective traffic. It must be constructed as cheaply and as durably as possible, in order that the first cost plus that of maintenance may not be too heavy a burden upon the community. Having these principles before us, we must first ascertain what road-building material is to be found along the line of the proposed improvement and utilize it as far as it is possible with due regard to the ultimate economy. For example, a softer stone on a light-travelled road will yield as good returns on the investment as a hard, tough trap on a heavy-traffic road, and often at a saving of 40 per cent. on the first cost. Although we are comparatively a densely settled community, we have to count the cost, and I presume that same fact will apply in this Province. The question of transportation of material is often a very great one and a very expensive one, and if you can utilize the materials in your own particular locality and still obtain fairly good results, you may be able to improve your roads and at a later date, as we have done, add a more lasting top to the original pavement.

Yesterday I heard something from this platform in reference to bonding, and it was rather insinuated that we were very wrong in bonding for any period of time. —that the pavements wear out and that possibly the future generations would have to pay for something they were not able to enjoy. With us, about 50 per cent. of the original cost of the improvements is for the grading of the roads and the

straightening of the alignment. We have a great many old roads laid out from one farm-house to the other without any particular reference to a direct line, and there are many sharp turns. In order to bring our roads up to present-day requirements, it is often necessary to widen out the roads for the accommodation of the traffic and cut down the hills and fill the hollows and, as our good friend who introduced this Convention in his invocation quoted from good old Isaiah, I would like to say that some years ago I was called down at a Farmers' Convention for being too new-fangled. They said, "This idea of cutting down the hills and filling up the hollows is all new," and they happened to be rather a religious community. I asked them if they had ever read the Bible, and I told them if they had that my idea was not new-fangled, because Isaiah himself has described the ideal highway: "*Every valley shall be exalted, and every mountain and hill shall be made low; the crooked shall be made straight, and the rough places plain.*" There is nothing new under the sun.

We have ten million square yards of waterbound macadam, principally in the northern and central districts; over six million square yards of gravel in the southern and seashore districts; and two hundred thousand square yards of oyster shells along our bays. Each of these has served its purpose well until increasing traffic has so augmented the cost of yearly maintenance that it has become necessary to change the type of the wearing surface, the old pavements serving as a foundation for the new, thus obeying the old injunction of cutting our garment according to the cloth. The wisdom of this practice is proven by our experience as follows: The assessed valuation of all of the property along a certain road was based on the farm values at that time; five years later the assessed valuation had increased five millions of dollars. The reasons for this were twofold: first, the improved road enabled the farmers along its line to haul four times as much over the road as before and in less time, thus greatly reducing the cost of transportation, and by this means increasing the profits and consequently increasing the value of the land. I might add, also, it improved the condition of their horses, because the teams that were used to haul the produce to market were generally more or less in a run-down condition, while the same horses with the same feed on the good roads were always in fine condition, and did not look as though they were hoping that the graveyard would soon be their home. Secondly, the improved road induced people seeking country homes to purchase land and erect residences along its line. Thus, as the travel increased, the necessary funds to maintain the road increased without increasing the tax rate. This is the logical method of road improvement as viewed in New Jersey. Therefore, for the entire State we have no one standard type of pavement, but rather as many kinds as we have varieties of material and weight and intensity of traffic.

As we are situated between the two largest cities on the Atlantic seaboard, our main highways are subjected to a heavy and constantly increasing traffic. This has forced us to resurface many of our old stone roads with bitumen, either as a surface application or in the form of a concrete. One million square yards have received such a surface treatment, while two million more have been paved with bituminous concrete. In addition to this, twenty thousand square yards of concrete have been laid, and of this over fourteen thousand square yards were treated with a bituminous paint coat. Lastly, we have applied a material which comes from the Old Country, manufactured from wood pulp, known as lignine binder, and have used over a million and a quarter gallons of it on our gravel roads, and this makes it convenient for travel at all seasons of the year.

A great deal of work has been done towards improving the alignment on our old roads. Sharp turns that have been the scenes of many collisions have been eliminated, and the roadway, at road intersections, has been widened, thus greatly reducing the probability of accidents. A point I would like to impress upon you gentlemen is that too often at a road intersection or sharp turn in the road there are trees or buildings on the inside of the turn, and there is often strenuous objection to the removal of these obstructions. To overcome that we go back of the buildings and straighten the line in that way, our idea being that one human life is worth more than one or two sheds. In fact, a large portion of our work on old roads during the past years has been done with the view of promoting the safety of the travelling public. Alignment and grade are two factors that are becoming as important in highways as on railroads. The saving in cost of maintenance and the promotion of the safety of travellers are demanding and receiving far more attention now than ever before. (Applause).

Mr. J. J. Parsons: Might I ask a question of Mr. Meeker? He mentioned the question of paying for the cost of the road in a short period of time or long period. I would like to ask what his opinion is with regard to that—whether it is better to spread the cost over a long or short period?

Mr. Meeker: That question can be answered in two ways. Our method is to provide finances. We do not issue straight long-term bonds; our bonds run from periods not less than five or more than thirty years, providing for a sinking fund, and after a lapse of about twenty years the greater portion of the bonds is taken care of. It is fair that a bond issue should be made for half the cost, you might almost say two-thirds. We often hear the statement that a road is worn out, when only the surface is gone and a new surface may be placed on it for only one-third of the original cost; it is on that basis that we figure out the cost.

Mr. Lyons: What proportion is paid for by the county and what by the State?

Mr. Meeker: Our rate of division is this: the State pays 40 per cent. of the cost, the township 10 per cent. and the county 50 per cent. Originally our law provided that the property owners along the line of the road should pay 10 per cent. of the cost, and that met with quite a little opposition, and justly so. Very often a man living near the market town would have property much more valuable than one farther out in the country and he would pay 10 per cent., while another man living just off the road would pay nothing and yet might use the entire length of the road. The road was an advantage and of value to that township and all the people of the township, and therefore we judged it was fairer to assess 10 per cent. of the cost on the township direct.

Mr. Beam: There was some advocacy of the frontage tax last year and this year. They are still advocating the frontage tax and it is a mistake.

Mr. R. H. Fair: Does the State issue the bonds or the county?

Mr. Meeker: We are rather a "Home Rule" people in New Jersey; each community prefers to suggest what it wants and the suggestion comes from the community to the township, from the township to the county, and from the county officials to the State. The State does not go and say, "See here, we are going to build a road whether you want it or not." The State waits for the county to come to it and say, "We wish to build a road through a certain section." The county waits for the people in a particular township. Out of these numerous requests, the county first selects what it considers is the most valuable road for the county at large, and the State selects that which it considers is the most valuable to the State at large; so it is simply a question of selection.

PROF. LAING: With reference to the issue of bonds, the suggestions that were made here yesterday were probably a little new to some of us. The extraordinary length of period for bond issues was brought out by Mr. Diehl of New York State. The question appears to be one of—if I understand your remarks correctly—having some relation between the foundation that is constructed and the life of the bond. Have you any such practice or would you advocate that some fixed relation should be carried out in the issue of the bond with reference to the probable life of the foundation? The foundation of course, we all recognize, is the important factor, and you may, upon a foundation with a long life, construct several surfaces. But the question is, should we have some definite relation between the probable life of the foundation that is constructed and the issue of the bond?

MR. MEEKER: Possibly I do not make that as clear as I might. The maximum limit of our bond issue is thirty years, while the minimum is five years. We begin retiring our bonds at five years and continue retiring them from year to year, until at fifty years the entire bond issue is wiped out—this being the idea, that no pavement can be guaranteed to last longer than thirty years. I say that, and I am open to contradiction on that point. I have been in the business myself about twenty-eight or twenty-nine years; I have seen a great many so-called permanent pavements wear out; it depends on the weight and intensity of the traffic. About the longest you can rely upon a pavement lasting in a smooth, even condition is thirty years. Therefore, we do not advocate any longer period for bonds.

MR. W. D. FLATT: How is the maintenance of these roads arranged for?

MR. MEEKER: That is arranged for in our State by the receipts from motor vehicle licenses and fines. We have very heavy motor traffic, and the money derived from licenses of motor vehicles is used solely for repairs of the roads, and the practice of the State has been to contribute $1.00 from the motor vehicle licenses for every dollar the county or the municipality would raise. We have learned, through bitter experience, that when you hand out money to a community and they do not contribute anything, they do not think the improvement is worth very much. It is coming back to the old homely statement that a thing is only worth what it costs you, and we have found that when the localities have to contribute their share of the cost, they are much more particular as to the quality and quantity of work that is done for the money expended.

MR. A. A. COLWELL: By your method of adjusting the taxation, would you consider a man owning property, say fifteen miles from one of these main trunk roads, called upon to contribute, first, his share to the Government's portion, forty per cent., then his share to the township, and then to the county. Would not you consider that man as being over-burdened, living fifteen miles from the road, while the next farmer adjoining the road does not pay one single dollar more than he does, only as his property increases?

MR. MEEKER: My answer to that is this. Our farmers, no matter how remote they are from the trunk line, are not only ready but willing to pay their share of the taxes for road improvement. Some years ago when we had no roads as good as we have now, a farmer came into the Road Commissioner's office and he was out. I looked at the man and thought to myself, "This man is here to raise just about as much rumpus as he can, and to tell us the same story as we heard in days gone by about the farmer paying all the taxes, and if it was not for him everything would go to the bow-wows," and, therefore, I thought I would try and draw this man out a little so that he would be in a little more amiable state of mind when he met the Commissioner: so I said, "Is there anything I can do for you in relation

to roads?" He said, "Yes. We want a stone road; we are tired of switching around our neighbours five or ten miles away. We are willing to pay our share; we have paid our share on the other road, and we want a hard road so that we can get to market. We are willing to pay and so are all my farmer friends around, and the quicker we can get it the better." I said, "You might have a temporary road." "No, we want the best, and we are willing to pay for it." We find that disposition all through the State. Originally it was not so, but the farmers are very quick to learn, and they pay their share of the cost of the road immediately in front of their property, and also in front of their neighbour's.

"ROAD FOUNDATIONS."

J. Duchastel, Esq., City Engineer, Outremont, P.Q.

I have no intention whatever, in coming before this meeting, to attempt to lay before it any new theories upon the question of foundations for roads. I have been assigned this subject by the President of this Convention and have collected together hurriedly information which I think might impress upon some of the laymen present at this Convention the great importance of a wise and properly designed foundation for rural roads.

Roads have been constructed, and very good roads at that, way back in antiquity. Herodotus in his works speaks of a great Egyptian road constructed during the reign of King Cheops, upon which one hundred thousand men were employed for ten years. The great City of Babylon, we know, was paved about the year 2,000 B.C. Rome started its famous road construction under Appius Claudius about the year 312 B.C., and I think that no one will dispute that one of the factors which contributed in a large measure to the greatness of the Roman Empire was its system of Good Roads, extending from its heart to the most remote settlement. These roads built during antiquity were substantially built, and I know none to which the term "permanent" is more adaptable. Quite a few are still in existence throughout Europe and I think some are yet in use. I remember perfectly well as a boy having seen a remarkable type of Roman road still in good condition near my father's homestead, in one of the districts of north-eastern France, little known over here until its name, hard to pronounce for the Anglo-Saxon tongue, has become sacred and will forever spell with many other French names the glorious history of British arms. I refer to the Department of the Aisne. (Applause.)

Should we wonder at the permanency of the Roman roads, when we stop a moment to examine or study their type of construction? Byrne, in his treatise on Highway Construction, describes the construction of a Roman road in the following manner:

"Two shallow trenches called *sulci* were first dug parallel to each other, marking the width of the road. The space between them was excavated to solid ground; in this excavation the road materials were placed, arranged in four layers, having a total thickness of about three feet:

"(1) The *statumen* or foundation consists of two courses of flat large stones laid in lime-mortar, or of stones not smaller than the hand could grasp.

"(2) The *rodus,* composed of broken stones mixed with one-third their quantity of lime-mortar, and forming a layer about nine inches in thickness.

"(3) The *nucleus,* composed of fragments of brick, stone and pottery, set in lime-mortar and about six inches thick.

"(4) The *summa crusta* or *pavimentum,* composed of large irregular shaped stones about six inches thick, closely jointed and fitted with the utmost nicety.

"These roads bore uninjured the weight of columns, obelisks and other immense blocks of stones weighing hundreds of tons; notwithstanding this, the utmost weight which each class of vehicle was permitted to carry was regulated by law, and those laws were strictly enforced."

One immediately realizes that road foundations built as those of the Romans would be, under our present conditions, an absurd waste of labour and material. But we also know that far from falling into this faulty extravagance we have been accustomed, on this side of the Atlantic at least, to skimp considerably in the construction of the foundations of our roads, and in many cases have neglected them entirely.

There are a few fundamental principles I would like to bring out here. In the first place it is necessary to realize that the real foundation of a road is the earth subgrade upon which the road is constructed. Secondly, the lower layers of a road, which we call the "foundations," should theoretically last forever. Thirdly, the stability of a road depends largely upon the state of dryness of the sub-soil.

Let me enlarge upon these principles. First of all we shall treat of the bearing power of certain soils. McClintock has estimated that the non-porous soils, drained of ground water, will support with ease a load of four pounds per square inch under the most unfavourable conditions. Sand and gravel can safely carry a load of twenty pounds per square inch when perfectly drained. We therefore have a well established range of bearing values for different soils and we can decide, after careful examination of the soils over which a proposed road is to be constructed, what loads the different sub-soils can carry. Having established these facts we shall proceed to determine the thickness of the foundation. We know that the pressure exerted by any load upon the surface of road is transmitted to the sub-soil below in all directions under an angle of forty-five degrees with the vertical; that is to say, the area of the sub-soil which bears the load is that of the base of a cone which has a height equal to the thickness of the foundation, and whose side is at an angle of forty-five degrees with the vertical. In practice, however, a slightly larger area is taken which is equal to a square having for sides double the thickness of the foundation. Knowing these facts, the next point to consider is the nature of the traffic the intended road will bear, and to be absolutely on the safe side, it will be necessary to foresee to some extent future traffic that may be induced to make use of the future road on account of its improved condition or on account of other causes. Harger and Bonney believe that a good road should be designed to carry a wheel load of 4,200 lbs. on a tire six inches wide. The thickness of the roadway can then be found with ease.

We come now to the second principle, that the lower layers of a road should last forever. So long as the type of road remains the same, as in the case of country roads, there is no reason why the foundation should not be absolutely permanent. It is the top surfacing that will be worn in time and renewed at different intervals, but the foundation should be constructed with the idea that it is a permanent institution, and there is no reason to doubt its permanency if it is well constructed. Therefore in a new road great care should be taken to construct a well designed and economical foundation. The permanency of this foundation in villages and small towns may be questioned, when one takes into

consideration the fact that different improved types of pavement replace one another to meet the local development. This is quite true, but these cases are exceptions to the general rule of road construction taken as a whole.

The third cardinal principle of road construction is the drainage of the sub-grade. Everybody knows that the two enemies of Good Roads are water and frost, and that they are very intimate allies working in conjunction with one another at certain times of the year. Eliminate the first one and the other one will disappear. The main object of drainage is as follows, to lower the level of the ground water in the sub-soil so that it is maintained in as dry a condition as possible. The importance of this point cannot be too strongly emphasized. The sun and wind may dry the surface of a road but, if the sub-soil is water-logged and soft, it is a foregone conclusion that before many moons the whole structure shall become a sea of mud. How many times have we seen mud oozing up through the country roads and even through some of the macadam pavement of streets in cities we hate to name. A further object of drainage is to remove any water that may be released from the ground itself by thawing in the springtime. There are many different ways of obtaining a good drainage of the sub-soil. These should be carefully considered before adopting any special type for a new road. The best expert advice on this matter should be obtained without hesitation, as it will certainly be most economical in the long run.

There is another type of foundation mostly used in connection with city pavements, which is the concrete foundation. I do not intend to dwell lengthily on this type except to say that it requires, like all other foundations and more so specially on account of its high cost, a very thorough drainage of the sub-soil. When the ingredients in a concrete foundation are well proportioned and of good quality, it is without question the best foundation one can recommend. The question of thickness of a concrete foundation has been the subject of discussion lately. It has been found, I am informed, that some of the concrete foundations of roads in Great Britain have been going to pieces under the very heavy autobus traffic and have had to be reconstructed at great cost to thicknesses of nine and even twelve inches. I believe that most of these concrete foundations in England are constructed with natural cement concrete and I am inclined to think that if Portland cement was used, six inches would be found sufficient.

There is another very important problem to study in the foundation line and that is the determination of the proper type of foundation for streets over which there are lines of tramways. I do not know that in Canada, at least, this problem has been thoroughly solved. Most defects in this connection are traceable in my opinion to poor drainage. Naturally one should not jump to conclusions and forget that the weight of the street railway car is increasing every year, and that there are many other factors in this problem. I have just brought this subject up as I consider it a very important one and hope it will be thoroughly discussed at this meeting.

May I be allowed to close by a few notes on my personal experience on the construction of roads, which is confined, I am sorry to say, only to the City of Outremont. Our conditions are somewhat out of the ordinary. The sub-soil is composed practically throughout of a soft limestone found within a few inches from the surface. Through this limestone occasionally protrude narrow dykes of trap rock called locally *banc rouge*. We make it a fast rule never to construct any roadway through a new subdivision before the sewer is built and the water main laid. On account of the rocky foundation I have just mentioned, we have on hand, before starting road construction, great quantities of broken stone piled up along

the proposed roadway which have been extracted from the sewer cut. This stone, which we have in abundance, is unfortunately rather soft for any top surfacing; it is easily pulverized and would produce a very dusty road. Two quarries situated in our city supply a much tougher stone at fair prices, at an average of 90 cents per ton.

Our streets are all at least 66 feet in width and our roadways generally 30 feet wide, with sidewalks 5 feet wide. We therefore have boulevard or parking strips of at least 13 feet on each side of our streets. As there is always a great scarcity of soil for the grading of these parking strips, we are compelled to excavate more from the level of the future roadway than we would do under other conditions. On the other hand, as we have a great abundance of stone, we have made it a practice to build by hand a Telford foundation with the stone referred to above. We spread over this foundation a layer of scrap stone, which is obtained from the same source; then, after a thorough rolling, we build up the road with about three or four inches of the harder stone obtained from the quarries and use a tar or asphalt binder. I might mention that we always see that the sub-soil is properly shaped and thoroughly rolled before starting the Telford foundation. With this foundation we have a well drained structure, and any ground water or surface water that might percolate through the top surfacing will find its way, on account of the camber of the sub-soil, to the sides of the roadway. Along these sides we have an underground drain (French drain) of broken stones, about 6 in. x 6 in. in section and situated 24 inches below the curbing of our concrete sidewalks. These drains are intended to carry off any infiltration water to the brick or concrete catch basins, which have small openings in their walls to allow this water to reach the sewer. The cost of building these Telford foundations is low in our case; I find that last season the cost varied from eight to nine cents per square yard, including foreman's wages, carting of materials and labour, the stone, as explained before, not costing us anything. I have experienced no trouble due to the heaving action of frost in connection with this method of construction. I may add that I have always made it a practice to have all new roads thoroughly rolled in the springtime, as soon as the frost is out of the ground, and I believe this to be a good practice.

A Delegate: I was interested in the outline of some system of drainage for ordinary country roads. What would you recommend for the drainage of an ordinary country road?

Mr. Duchastel: As I have tried to bring out in my paper, the question of drainage is rather complex; it all depends upon the nature of the soil you have to go through. In some cases, if funds are sufficient and you have an abundance of field stones, you might put in a stone foundation: in other cases it might be found cheaper to build tile drains. You must also consider the grade of the roadway, and whether you are dealing with a hilly country or a flat country. All these questions have to be taken into consideration.

Mr. W. H. Pugsley: I have a motion which I would like to make:

"Moved by W. H. Pugsley, seconded by J. J. Parsons, that H. J. Bowman, of Waterloo, and A. M. Chapman, of Hastings, be appointed auditors, to report Thursday afternoon." (Carried.)

Mr. N. Vermilyea, Belleville, Ontario: Our greatest work in this country is not the building of a road just now, but the travelling of a road, and the direction of the road we are travelling is to a place called Berlin ("Hear, hear!" and applause), and as certainly as we are interested in the building and maintaining of Good Roads in this country, just so certainly are we going to travel the road successfully to Berlin. (Applause).

I have a motion I wish to move:

"That the best wishes of this Association be tendered to Ex-President Major T. J. Kennedy, of the Governor-General's Body Guard, who has enlisted for active service at the front."

Mr. Pugsley: I take great pleasure in seconding the motion. Major Kennedy has worked hard for the interests of Good Roads, and I am satisfied he will fight and work just as hard for our interests in France. I have great pleasure in seconding the motion. (Carried with applause, after which the entire audience rose and sang "God Save the King.")

Mr. Michaud: I wish to move:

"That the Canadian members of the Convention wish to express their keen appreciation of the honour done them by the attendance of their friends from the United States, who are represented here by a number of learned and distinguished men."

Prof. Laing: I have great pleasure to see with us so many men who have devoted themselves to this admirable cause on the other side of the line. I have pleasure in seconding the motion. (Carried.)

Mr. Michaud: Another motion:

"The members wish to express their regret at the illness of Mr. McLean and deeply feel that they are missing the great benefit of his experience and knowledge of Good Roads."

Mr. Meeker: I second that motion and certainly miss him very much. It was through him that most of us on the other side of the line came up to this Convention, and we are more than sorry to hear he is not able to be with us.

The Chairman: We are all very pleased to have this motion seconded by Mr. Meeker. (Carried.)

Mr. Geo. W. Tillson, President, American Road Builders' Association, Brooklyn, N.Y.: In response to the first motion that this Convention has so graciously carried, I wish to thank the Convention on behalf of the members from the United States, and to say that as much as we are interested in Good Roads, we are just as much interested in the progress of your road to Berlin, and we hope you reach there at the earliest possible moment. (Great applause).

Mr. Parsons: "Moved by J. J. Parsons, seconded by Geo. Hammond: That in the opinion of this Convention the application of the railways of Canada for permission to increase freight rates should not include road-making materials, and that a committee consisting of W. H. Pugsley, James Sheppard and S. L. Squire be appointed to bring the question of proposed increase in freight rates on road-making material to the attention of the Minister of Public Works and to arrange for the representation of this Association before the Railway Commission." (Carried.)

Mr. R. H. Lush: Moved by myself, seconded by R. B. Coulter: That the Secretary-Treasurer receive the usual honorarium of fifty dollars. (Carried.)

Mr. Michaud: We must decide to-day or some day soon where the Convention will be held next year. Last year we held it in Montreal and this year in Toronto, and I would like to extend an invitation to the members to come to Quebec next year. Quebec is a quaint old city that has too much the reputation of being an old city because we have old houses and old monuments and very fine scenery. But we have also very modern ideas as to road improvements. We have appropriated large sums of money for road improvement, and we have built roads for the last three or four years. We have built nearly 1,000 miles of macadam in the Province of Quebec, and nearly 500 miles of gravel roads. We have arranged for the maintenance of a certain number of earth roads, and we are studying the question more and more every day, and we are sure to come to greater results in the future. We have a road which connects the Canadian people and the American people. We admire the American people and like to see them here, and we will be happy again to see them. In fact, we see many of them in Quebec; they are our best clients, and they like Quebec also. I think it is my duty, on behalf of the Province of Quebec and personally, to extend a very earnest invitation to come to Quebec next year. I think we can receive our people—because you are our people—very well and graciously and give them a pleasant time. At any rate we will do our best. (Applause.)

The Chairman: I wish to say that so far as the hospitality of Quebec is concerned, there is no doubt about it. Last year, at the first Conference held in Montreal, there was no question but what the Province of Quebec and the City of Montreal did splendidly for the entertainment of the delegates, and I am sure the Executive will take this invitation of Mr. Michaud into its most serious consideration.

"MACHINERY."

F. E. Ellis, Esq., Manager of Essex Trap Rock and Construction Company, Peabody, Mass.

A score of years ago road-building was a very simple business requiring only a small amount of plant. Very little expense was incurred by anyone who wanted to enter into it, and one in the business could withdraw from it without sustaining a great loss due to the amount of capital tied up in the plant. During the last twenty years the method of road-building has gradually changed until the plant now required by the contractor is large and varied and the expense attached thereto is enormously large in proportion to the amount of work done per year. One should not enter the road-building business without considering thoroughly the kind and amount of equipment required to do the work, and only after a careful estimate has been made of the expense of plant and the proportionate charges that should be made for its use. One must also realize that once in the business, he must remain in it for many years in order to get back the cost of his equipment, or else be willing to take a loss on the sale of it upon retiring. In other words, it is not a business that a man should go into with the idea of its being temporary. Failure to understand or obey this principle has been very disastrous to many contractors.

The kind and amount of equipment required for building a road will vary a great deal, depending upon the type of road, character and amount of the material to be handled, length of haul, conditions of road and bridges over which hauling has to be done, number of working days allowed for completion of the work. For example, I am going to show you what it actually cost to equip a road with a proper construction plant. The road built was six miles in length, surfaced with local stone, grouted with bituminous binder, sub-base six inches thick composed of field or quarry stone extended the entire length of the road. Excavation averaged about three thousand yards per mile of mixed character (loam, clay and gravel), hauls on excavation not exceeding two thousand feet, and excavation fairly uniformly distributed over the length. The ledge excavation amounted to about fifteen hundred yards located at several points along the road. Surfacing stone was obtained from a quarry adjacent to the road, the average haul being two miles. A job of this size is considered an average season's work for one gang of men and one set of equipment. The estimated cost of the road was $60,000.00; the total cost of equipment was $18,240.00 or 34 per cent. of the contract price. The interest on the cost of equipment at 6 per cent., and depreciation at 10 per cent. per year, would make a total of $2,918.40 for fixed charges on equipment necessary to do $60,000.00 worth of work per year, or approximately 5 per cent of the total estimated cost of the work. Most of the expense of equipment was chargeable only to the items that go to make up the surfacing; the estimated cost of these items was approximately $32,000.00; The cost of the equipment used in the work covered by these items was $16,445.00, or 51 per cent of the work done; while the interest and depreciation, estimated as before, would be $2,631.20, or 8.2 per cent. of the amount of work done. This I believe to be a fair estimate of the charges that should be made in order to be safe in estimating work of this character. There is hardly any business conducted in which the investment for equipment is so large and the expense due to depreciation and upkeep so great as in road-building.

Road-building machinery should be purchased only after a thorough investigation, especially as regards the liability of breakdown and the expense of upkeep. The expense of repairs on road-building machinery is very small in comparison with the loss occasioned by the disorganizing of working crews due to breakdowns of machinery. In deciding upon the purchase of machinery too much weight should not be given to the item of first cost, as the machine more expensive in first cost may be a far cheaper machine to operate and may be depended upon to do its work day in and day out; whereas a cheaper machine, although it may not break down, is very liable to do so. It is comparatively a simple problem to estimate the expense of plant and to choose the different machines to do their particular portions of the work in the most economical manner, provided the assumption is made that the machinery bought will be used 200 or 250 days per year and be kept in continuous operation during each working season for the life of the machine upon the same class and character of work for which it was bought. This method of estimating the expense of plant has been adopted by many machinery salesmen, and has been accepted by many road-builders when they are new at the business. This method, however, has been disastrous to many road-builders. It seldom happens that any road-building machinery can be used 200 or 250 working days in the year continuously throughout the life of the machine, even with the most flexible equipment—that is, equipment that can be used economically under varying conditions. There are times when it will be idle. The road-builder who purchases road-building machinery that can only be used under certain conditions generally finds him-

self with a lot of idle equipment on his hands, and his time occupied in travelling around the country trying to find some job that fits his equipment. I think it would be very much better if road-builders would buy equipment that might be fairly economical in operation under a variety of conditions, than by the purchase of machinery that can be operated economically only under a fixed condition, as in most cases this economy can only be shown on paper by the assumption that the machinery can be used continuously throughout its life.

It is not intended in this paper to recommend the use of machines of any particular manufacture, but to describe some of the types of equipment in general use and to specify under what conditions they can be economically used. The actual conditions under which machinery is operated are never exactly the same, and in any general estimate of the cost of operation would be misleading.

(1) *Waygons.*—Four kinds of wagons have been largely used on road-building; the four-wheeled bottom-dumping wagon, four-wheeled two-horse tip cart, the two-wheeled one-horse tip cart, and the four-wheeled slat wagon. The slat wagon offers no advantages except that it is a little lighter, lower and easier to load; this advantage is outweighed when the time lost in dumping and turning around is taken into consideration. The one-horse tip cart is economical on short hauls and for work in a contracted space, for making end and side dumps on embankments or for short hauls of stone to crusher. The four-wheeled tip cart hauls and is handled very easily on road work but, the weight being on the rear wheels, it is very destructive to road surface and subgrade, and much time is lost in dumping and righting the wagon. The bottom-dumping wagon can be used anywhere that the other two-horse wagons can be used and is more economical than either, the expense of maintaining the roadway being very much less than with the tip carts. Material can be dumped more quickly, it not being necessary to stop while dumping, and the material can be distributed to better advantage than with the other types of wagons. Any wagon used on road work should have tires not less than four inches wide.

(2) *Road Machines.*—A road machine can be used to advantage in digging side ditches, surfacing subgrade, scraping shoulders and making light cuts in the roadway. A machine for this purpose should be built strong enough to be hauled by a steam roller or traction engine without danger of breaking the machine, and be equipped with a steering device so that the machine may be worked outside of the travelled roadway while the tractor is working upon the firm travelled way.

(3) *Crushers.*—Three types of stone crusher have been used to a great extent in road-building; the gyratory type, the jaw type of the Blake pattern, and the jaw crusher of the cam shaft and roller type. The gyratory type is not very well adapted for portable plants on road work, as the crusher opening is so narrow that the stone requires too much sledging in order to be properly fed to the crusher, and in some of the machines of this type the opening is so far above the ground that it generally requires either a pit or an extremely high dumping platform in order to get the stone into the mouth of the crusher. For permanent plants, where the stone breaks well in blasting, they are a very economical machine. The advantages of the Blake pattern are the extreme simplicity, there being a less number of reciprocating parts and bearings which require oiling than in any other type; there is a wedge adjustment by which the opening may be regulated without stopping the crusher; there is only one tension rod and spring to keep in adjustment and repair; and there are no bearings into which stone chips and dust are liable to enter. This type of crusher is very economical to maintain and extremely reliable. The disadvantages of this type are that for the same size opening, the crushers weigh more

than the other type of jaw crusher; they are not so easily transported and handled; the situation and size of the flywheels make it more unhandy to dump close to the crusher than in the other types; and as a rule the first cost is in excess of the other types. The advantage of the cam shaft and roller type crusher is light weight, low flywheels situated so that the stone may be dumped closer to the crusher than in the Blake type, low first cost, and speedy delivery of repair parts. The disadvantages are that they are more complicated, have more moving parts, and more bearings to be lubricated, and the toggle lever shaft is generally situated so that chips and dirt can enter into the bearings. Both crushers of the jaw type here mentioned will produce about the same amount of broken stone for the same size of receiving opening, and require about the same horse-power to run. All crushers should be fitted with manganese steel jaw plates, as the chilled iron plates may break or wear out in pockets after running a very short time. Most of the crusher manufacturers make complete plants composed of crusher, bins, elevator and engine, mounted upon wheels, and they can be loaded upon freight cars without being knocked down. Plants built in this style are very economical to handle and are adapted to nearly all kinds of work requiring crushed stone. Where a traction engine is used for hauling stone away from the crusher, it is more economical to have larger bins and longer elevators than are generally furnished with a strictly portable outfit, as it is necessary to have a storage capacity sufficient to load a train of traction cars without waiting for the stone to be crushed.

(4) *Crusher Engines.*—Crusher engines should always be large enough to have a surplus of power over and above that which is ordinarily required to run the plant, and the boiler should have additional capacity sufficient to supply steam for a drill. If this is not done, an additional boiler will sometimes have to be provided. In most places there are laws which govern the inspection and construction of boilers. Care must be taken to purchase boilers that will pass inspection. There is no uniform boiler law in the United States, but I believe that any boiler built in accordance with the Massachusetts standard can be used in other States, but there are many boilers used in other States that cannot be used in Massachusetts. These remarks apply as well to road roller boilers and boilers of any kind.

(5) *Hauling Engines.*—Where there is enough work to keep a hauling engine busy, and suitable provisions can be made for loading and unloading quickly, a hauling engine may be used to advantage. The ordinary three-wheel steam roller can be changed into a very efficient hauling engine very quickly by replacing the front roller with two special wheels. Unless there are very heavy grades in the road, hauling engines will not be economical on road work, when the haul is less than a mile, except under extraordinary conditions. They can generally be operated anywhere that a pair of horses can go with a load, and over very much rougher road than that over which it would be economical to use motor trucks.

(6) *Trucks.*—Automobile trucks can be used economically where the road is in good condition, where the hauls are long, and there are facilities for unloading and loading quickly. The economy of a truck depends upon its speed, and any conditions that would cut down the speed would tend to make the hauling by motor truck unprofitable. The weight of trucks and load, and of traction engines and load, being much heavier than horse-drawn vehicles, special attention must be given to the condition of the road and the bridges over which it is proposed to use this equipment. The expense of maintaining the roadway or strengthening bridges in many cases would make the horse-drawn vehicle more profitable than either the truck or tractor. Trucks and tractors can very seldom be operated at the same

time and place with horse-drawn vehicles without lessening the theoretical economy of both methods of transportation.

(7) *Road Rollers.*—There is no class of machinery that is so universally used in road-building as the road roller, nor is there any machinery where there is such a wide difference in construction and design and first cost as in steam road rollers. They may be obtained in almost any shape and of any design that can be thought of. It is generally conceded by road-builders that the double-cylinder steam road roller is better adapted for the work than any other. No other class of road-building machinery has been so highly developed. The wide variation in the first cost of the different steam rollers makes it very difficult for one new in the business to make up his mind which ought to be purchased. There is almost as much difference in road rollers as there is in watches. You may purchase a watch for a dollar that is liable to keep good time for a year, and it is liable not to. You may purchase a watch at almost any price, and in every case you will probably get just what you paid for. As a general thing, the higher price, up to a certain limit, the more dependable the watch is, and the same rule applies to road rollers. In looking over a road roller with a view to purchasing, particular attention should be given to the gearing and wheels. One can generally tell, by the look of wheels and gears of a machine that has been in use, whether that machine is going to do the work day in and day out as it ought to. A set of rear wheels should last under ordinary service at least ten years. The gearing on steam rollers should be of steel, and cut and fitted as nicely as in any high-class automobile construction. Gears should be enclosed so as to exclude dust.

(8) *Wagon Loaders.*—Where a large amount of material is to be delivered on cars, some form of wagon loader can generally be used with economy. Most of the economy will come from the saving in time by quickly loading the transportation equipment. The small bins that are attached to the side of the car can be used economically in loading vehicles of small capacity, material being shovelled by hand from the car into the bins. They can also be used where the space between tracks available for the manipulation of vehicles is much smaller than would be required by the hoppers that are mounted on wheels. The hopper mounted on wheels, where there is sufficient room, has the advantage in generally being of larger capacity and being more readily moved than the chutes attached to the side of the car; they are more expensive in first cost than car chutes. The most economical way of handling material from cars, when the amount of material warrants the first expense, is the portable elevator and bin. Material must be delivered in hopper-bottom cars, and the side tracks must be long enough, so that a full day's supply of cars may be pushed past the elevator.

(9) *Portable Track and Cars.*—The most economical way of transporting road material under certain conditions is by means of a portable railway. The choice of this equipment is governed by length of haul, width of road, the grades, the obtaining of right of way where the track has to extend beyond the location of the road built, and the expense of lighting and maintaining the track so that it would be safe for public travel. There is one great advantage to this method of transportation, and that is, that manufacturers of this equipment will rent it at a reasonable price, and the rental can be applied to purchase price if the purchasing of it is found desirable after it has been used.

FIFTH SESSION.

Wednesday Afternoon, March 24th, 1915.

J. A. Sanderson, Esq., Vice-President, in the Chair.

The Chairman: I am sure it is with much pleasure we learn that we are to have with us Major W. W. Crosby, Consulting Engineer of Baltimore. From what we have heard of the Major, I am sure we are all pleased that he has come over here to be with us this afternoon. I have much pleasure in introducing to you Major Crosby.

"DUST PREVENTION."

Major W. W. Crosby, Consulting Engineer, Baltimore, Maryland.

Up to ten years ago the subject of Dust Prevention on roads had received comparatively little attention, except in a few specific instances and in connection with city street maintenance. A few fruit growers had complained, especially where located along stretches of shell or soft limestone roadways, of the damage done by clouds of dust spread from the roads in dry weather spells by strong winds over their growing trees and vines but, in the main, a considerable amount of dust from even improved roads seemed to be regarded as an inevitable accompaniment of the serviceable roadway.

"Along came" not "Ruth" but the automobile. Immediately the dust question was vastly increased in importance and brought to general attention. The abutter began to receive the support and sympathy he deserved from the neighbours and from the visitors to the locality, from the travellers through it and even from the automobilists themselves, whose driving of their cars was interfered with by the clouds of the dust raised over the roadway. In fact the wide penetration or distribution of the effects of the increased dustiness reminds one of the story of the coloured men's discussion on the artillery now in use abroad. Strickland Gillilan tells it thus:

"Three coloured men stood on a Baltimore street corner.

"'Them English cannons kin hit yo' fi' mile off!' said George.

"'That ain't nuffin',' scorned Joe. 'Them thah French guns pick a man outer a tree, ten mile off!'

"Jim's scorn made him almost speechless.

"'You ain't said nuffin' 'bout shootin'—huh up! You all ain't mentioned *guns!* Wy all dem German shootin' irons needs is to know yo' address!'"

Even "the address" of the road authorities seems to have been given the dust, for they were forced to consider seriously the question first of dust suppression. Naturally the underlying question of "Dust Prevention" followed.

There were doubtless other factors aiding in bringing about the consideration, such for instance as greater public interest in and demand for better hygienic conditions on the roads as well as elsewhere, and the important matter of protecting the roadways themselves from the removal from their surfaces of fine material valuable for protecting in many cases the road crust itself from deterioration. It has never been suggested apparently that the remedy for the unhealthy and unsatisfactory dustiness of the highways was the abolition of the motor vehicle. On the contrary their increase in numbers and their development for all

sorts of purposes seems to be inevitable and probably fortunate. Therefore the antidote seems to be the curing of the defects of the roadway. There can be no one best material nor one best method, as conditions are "never—well, hardly ever"—twice alike. Some discussion here of the various conditions, materials and methods of use may therefore be pertinent.

General agreement among highway authorities has developed the fact that dust proceeds not only from attrition of the roadway surface by hard tires and the feet of animals, but also comes from the grinding on each other of the pieces of aggregate or road metal forming the pavement or crust. This internal wear of the surfacing is much greater than was formerly suspected, and it largely accounts in many cases for the layer of mud and dust to be found on macadam for instance, even when freely removed from the surface at frequent intervals by scraping or sweeping. The amount of the internally produced mud seems to bear a relation to the weight of the traffic and to the moisture present, such as results from sprinkling with water, as well as to the friability of the stone used and to the methods of construction. Heavy vehicles, even when shod with rubber tires, set up severe strains in the road crust and tend to make the particles of stone in macadam rub against each other in resisting these strains. If water is present in excess in the mass at the same time, the stones wear into mud more easily. Soft materials of course produce more fine material than harder ones under the same conditions. If the particles of material composing the macadam are closely knit and mechanically bound together by their angular shapes, they naturally move less under the strains and the rubbing, and consequent fine material produced is less in amount.

Real Dust Prevention, it will be seen, begins therefore with the construction of the road crust. In this work it will be necessary, in order to avoid as far as practicable the subsequent production of both superficial and internal dust—which latter rises eventually to the surface and becomes appreciable externally—by selecting road metal of the most appropriate hardness considering the traffic, by providing through proper drainage against the continued presence of an excess of water in the road crust, and by securing the firmest angular bond that the metal is capable of in the macadam. It has been found that, even where good road metal was used, and under light traffic, road crusts built with the use of an excess of fine material in their first construction have proved to be subsequently more dusty under the same conditions than where the fine material used was kept to a minimum. Evidently the excess of fine material not only from its presence easily furnished more dust to be raised, but also it prevented the closest interlocking of the coarser particles. This resulted in an increased movement of them under strains on the surface and therefore the production of more internal dust. The dustiest kind of stoned roadway is an old turnpike where the stones were liberally mixed with earth in order to help their compaction under traffic and where they are bedded, like plums in a pudding, in a matrix of fine material. With modern machinery and the construction of the macadam by sufficient rolling, the use of fine material should always be kept as low as possible. It will have to be used to some extent for filling the voids between the coarser particles, but even then, a selection for the finer particles should be made and as far as practicable that chosen should be highly resistant to the tendencies toward its reduction to dust. It will pay, in using limestone, to use, for at least fifty per cent. of the fine material required for bonding the macadam, clean sand such as would be suitable for mortar. In many cases all the fine material necessary may profitably be such sand even when used with crushed trap rock, and with shells no fine material

except such sand should ever be used. In no case are the best results ever obtained by the use of clay, silt or loam for binding macadam.

No matter how built, a roadway, even in city streets, may become superficially dusty, and the *suppression* of this dust from becoming objectionable may be desirable. Frequent cleaning or removal of the dust with the dirt may solve the problem, or it may be impracticable to that extent, and other means of relief may be necessary. The simplest of these is sprinkling with water to "lay the dust." The objections to this are as follows. It is seldom done efficiently because it has to be done periodically, and between the times of sprinkling, when a temporary excess of water is applied, the surface condition varies from muddy to dusty again. Further, the cost of sprinkling with water may not be economical if that is the sole reliance for the suppression of the dust. Proper cleaning with sprinkling or washing of the street surface may under some city conditions be satisfactory.

Efforts have been made to increase the effectiveness of water sprinkling by the use of sea water, which contains hygroscopic salts, or by the addition of such salts as calcium chloride to the water. Under some conditions the results have seemed to be successful to a certain extent. These salts absorb moisture from the air and tend to keep the roadway surface moist enough to hold down the dust, even after the water originally applied with them would otherwise have disappeared and failed to do this. Their effect, however, is not permanent nor is it powerful enough to meet severe conditions of traffic tending to produce or raise dust. Further, these salts are soluble and are washed away to the gutters and watercourses by rain. Their re-application becomes necessary at intervals more or less frequent according to local conditions. The salt itself (calcium chloride) has been used on the same principal, by being spread in a finely divided and dry state over the roadway surface. In this way the effects of it are perhaps stronger and more noticeable or lasting.

Another, what might be called "chemical," process consists of the use of concentrated sulphite liquor usually produced as a waste or by-product at wood pulp mills and commercially known as "Glutrin." The "Glutrin" is used either with or without the addition of water. The effects of the "Glutrin" are composite. It has some cementing powers such as exist with sugar. It also, through its tannic acid content, has a chemical effect on some of the materials composing the road crust which tends perhaps to strengthen their normal binding power; for instance, it may make a clay much more plastic and tenacious. Further, road surfaces treated with "Glutrin" seem to "set up" harder and, to some extent, to resist abrasion better. The "Glutrin" is, however, more or less soluble in water and eventually will be washed out of the road crust, even if the impregnation is fairly deep, as subsequent wetting of the crust brings the "Glutrin" gradually to the surface. Under some conditions the use of "Glutrin" as a dust preventive has been fairly successful.

The most successful of the materials used for either the prevention or suppression of dust on roadways are the bituminous materials, and they can generally be used for both purposes. If the voids in the road metal are, for instance, filled with bituminous material, the internal production of dust is prevented. The external production of dust even may also be reduced because of the cushioning effect of the pitchy matrix, and the greater resiliency thus given the piece of road metal subjected to the shock or attrition of traffic. If the bituminous material is only applied to the surface of the road crust, it still reduces the dust nuisance by suppressing the raising of the dust underneath or mixed with it, and in many

cases by protecting the road metal from any superficial wear from traffic. Further, a proper bituminous material possesses to a large degree, and greater than in the cases of other materials, the ability to absorb a considerable amount of dust produced elsewhere and perhaps brought on to the roadway through various agencies. This is important from the economic point of view.

What is a "proper" bituminous material will depend so largely in any case upon the local conditions that no close definitions can be given in this paper. Perhaps it might be said that, generally speaking, the asphaltic oils are better for this work than the paraffin base oils; that a good bituminous dust layer will give benefits other than the mere reduction of dustiness on the roadway, such for instance the reduction of noisiness and an increase in sanitariness, and that usually its proper application will be in the interests of both economy and general satisfaction. On the other hand, the improper use of an unsuitable bituminous material will produce results on the roadway second to none as far as nastiness and general dissatisfaction are concerned.

In closing this necessarily brief opening of an important subject, allow the speaker to repeat what he has said so often before—that is, try, too, in this work to be wise and profit from the experience of others who have used the materials, and do not depend wholly for information or advice on those who are pushing the sale of one or another so-called "dust layer."

Mr. Beam: What do you think of the concrete or brick road as being free from dust, especially the concrete?

Major Crosby: The concrete road allows no production of internal dust, and consequently all dust that comes from a concrete road is produced by either the wear of the surface or the reduction into dust of material brought on its surface. Now concrete is a brittle material that is quite easily powdered into dust. Concrete roads under severe traffic are likely to be quite dusty if they are untreated. In the case of brick roads, there is no internal production of dust, and there is very little, even less, attrition of the surface and even less production of dust from the road itself; under the same conditions there is an equal reduction into dust of material brought on its surface. In the case of brick roads, oiling has been fairly successful for suppressing the dust brought on or produced on the surface. Proper bituminous treatment of concrete has been also successful.

The cost depends on the local conditions. Ordinarily it might be said that concrete roads are less expensive at first cost than brick per square yard. That may not always be the case, but generally it is. Concrete roads will produce in a given time more dust, if untreated, than brick roads will under the same conditions. Concrete roads have been strongly advertised or advocated in the last few years. They should not be regarded as the cure-all or panacea for road-making. They have their proper sphere of action, and in it they are extraordinarily good; outside of it they are just as objectionable and there is no question but what concrete used as a foundation for a wearing surface is extremely effective. If you build a concrete road and cover it with a thin topping which acts as a wearing surface, it makes a very strong durable road, and if you maintain that topping, your concrete will last indefinitely if it is strongly built, and the whole question then becomes a matter of maintaining the carpet or linoleum on the floor. But if you build a concrete road and do not put anything on top of it, you are going to have in most cases a great many objectionable results; you are going to have dust and more or less uneven wear, cracks which wear into holes, and a rigidity which is objectionable to animals, and other difficulties which of course

vary with the conditions. I am not at all a believer in concrete as a cure-all; I am a believer in concrete within its proper sphere of action.

Mr. Vermilyea: It seems to be one of the great troubles we have to meet in rural parts. It is not the dust upon the ordinary road or made by the ordinary traffic, but the dust flung into our fields by the automobiles. The speaker did not deal with that. Most of the American papers presented here, splendid as they are, are perhaps five or ten years beyond us; they have reached a state of perfection in road-building that we know nothing about, and while we appreciate the papers they have given us, I think we have to confess they are a little beyond our common experience in rural parts at any rate. The automobile is not hard upon the roads under ordinary traffic; it has a broad tire, and is not a heavy vehicle except in a few cases. The difficulty does not lie there, but it lies in the terrible speed with which they are driven over our roads. They come along and pick up the little dust accumulated by ordinary traffic and fling it over the whole country, and if the wind is blowing a little, we farmers all know what that means. Why cannot we get such legislation as will compel the automobilist to respect the law. The automobile properly driven, as I said before, is a very harmless vehicle, but why cannot the automobilist be made to do his duty, and be made to respect the law. We have a law, and why cannot such a penalty be imposed that would stamp out this difficulty? At any rate it seems to me the Legislature ought to deal in a very practical way with the automobilist and make him feel that there are a lot of decent people living along the road and travelling upon the highway at the same time that he is, and they have rights the same as he has. It seems to me that is part of the dust question, and it is a question that stirs the public mind, and especially those who have to travel like myself with a horse and rig into town and sniff the dust all the way in. And the common people resent the speech which the automobilist practically repeats as he passes: "Go on in your one-horse rig; I am a great man and will travel at just such speed, whether it is violating the law or not, and you can sniff the dust and do your darndest." (Applause.) Should not this Convention speak up in a way that it would be clearly understood by the Legislature to say, "Give us legislation that will compel these fellows to respect the law and the rights of the common citizens who are compelled, by circumstances of their purse and conditions of life, to travel in a more humble way.

DISCUSSION.

Prof. A. T. Laing, Lecturer in Highway Engineering, University of Toronto.

The dust problem, like many other road problems, in its present acute form dates from the introduction of the self-propelled vehicle. This innovation in the methods of transportation brought about conditions as to load traction and velocity that formerly were little dreamed of. All three features mentioned have a direct bearing on the question under consideration. The heavy load of the motor truck not only breaks up the crust but produces as well internal attrition in the road metal, and the fine material works to the surface to form dust. In addition to this, the driving power of the engine is transmitted to the periphery of the wheel, thus producing a shearing or grinding effect on the road surface, and then the speed of the passing car finishes the work begun by the other two agencies and we

have the results which are so disastrous to the roads, add so much to the discomfort of the traveller and which are such a menace to health.

It is not out of place to point out that statistics recently compiled in Great Britain relating to Public Health show that the methods that have been adopted in recent years in dealing with road problems have materially lowered the death rate in rural communities. That is attributed, I think, to the ingenuity and skill with which the road problem has received attention at the hands of those in Great Britain.

The dust problem is two-fold in character; first, that of mitigating the evil by treating the dust with a palliative or a dust-layer; and second, that of treating the surface in such a way as to prevent as far as possible the formation of dust. These features should have careful consideration in determining which method is to be employed in a given case. In all probability we will, for some time at least, have to resort to the use of palliatives in many cases, and at this point the question becomes complicated. The climate, the volume and nature of the traffic all have a bearing, and added to this is the fact that there are on the market a great number of compounds from which a selection must be made and, as Major Crosby has pointed out, conditions vary so that there is no best material or method. If we leave ourselves open to the tactics of men who have goods to sell, you can naturally see where we are going to land ourselves. I do not think I ever saw a man selling goods who would frankly and freely come forward and tell you he believed the other fellow had the better article for your case; so that you must keep that in your mind when you are going to purchase materials. It becomes highly important, therefore, at this point that the advice should be sought of one who has a thorough knowledge of the subject.

Major Crosby states in his paper that of all the materials on the market the bituminous compounds are generally the most satisfactory. You may arrive without a great deal of difficulty at the point as to whether you are going to use some of the soluble salts that are offered or use the bituminous compounds. This may seem simple, but it is in reality a very complex matter, as there is such an infinite variety of these compounds. One important characteristic of any such compound is that it should have strong cohesive properties. As the presence of paraffin will reduce this property, an oil low in paraffin content is to be preferred. There are two kinds of paraffin, one which is of a softer nature and another which takes a harder form: and the harder one, of course, is the one which is more objectionable. You may use a fair amount of the softer quality and still obtain satisfactory results. It is also desirable that there should be present a high percentage of sulphur. A high percentage of low boiling products may be the source of unpleasant odors and will necessitate more frequent treatments. If there is a large percentage of oil present which boils at a low temperature, the high temperature on many of our streets at midday in summer, rising from 100 to 120 degrees, would volatilize these low boiling constituents. The ingredient to be desired is asphalt, but this must be fluxed with oils that will keep it in a plastic condition and at the same time render it convenient to handle. It will be seen, therefore, that even though a decision may have been made in favour of bituminous as against other compounds, the selection of the particular bituminous mixture is not a simple matter, and the aid of the chemist or expert should be sought. It is desirable that the kind that is used should be cumulative in its effect.

As regards the second phase of the question, that of treating the surface so that it will not yield dust, it is one very largely of the selection of the bituminous materials employed. There are many agencies which may be employed in this

connection, of course, but the construction of permanent surfaces—there are none really permanent, but we use that term in a restricted sense—will reduce the dust difficulty. The construction of a surface which will not yield dust certainly commends itself to any serious thinker, in that you are thereby eliminating a very undesirable element on the road surface and you are constructing more along permanent lines.

Dust is deterioration, and to the extent to which we eliminate its formation do we contribute to the maintenance. On this latter question the nature of the traffic will have a direct bearing. In constructing a surface that will not yield dust, we should keep in mind the nature of the traffic that it is to carry. The mat surface produced by using bituminous materials with gravel gives highly satisfactory results for automobile traffic, whereas it might fail under the shoes of horses and narrow-tired vehicles.

Much might be said, if time would permit, regarding methods of application, the temperature of the compound, and the comparison of hot applications with cold. It would be interesting if this discussion would bring out some of these points.

THE CHAIRMAN: Now, gentlemen, we heard from the Mayor of Toronto the day before yesterday, and we have the honour of having with us this afternoon the Mayor of Hamilton, and I am sure we will be pleased to hear just a word from the Mayor of Hamilton with regard to that Ambitious City.

ADDRESS.

C. S. WALTERS, ESQ., MAYOR OF HAMILTON, ONTARIO.

Mr. Chairman and Gentlemen:

Your Chairman has invited me to say a word to you, and by that I take it he does not want me to take up the whole afternoon telling you what I know about road-making, which, by the way, would not take up the whole afternoon.

I am very glad to be here this afternoon and to have this opportunity to say a word to you, gentlemen, who have come here to exchange ideas and to learn something in order to better conditions. I was much interested in the address of Major Crosby and also in the remarks of the gentleman, whom I take to be a Canadian, who just spoke. He made a remark about motorists, and as I happen to own an automobile, I would like to say to him and to you that the vital question with the motorist to-day is not so much how to lay the dust as how to raise the dust. This morning as I left the house my wife said to me, "I would like you to decide just which you intend to do this spring. Are you going to have the house painted or the automobile painted?" (Laughter.)

I was delighted to notice the friendly feeling that is apparent here, in that you have speakers both from the United States and from Canada. (Hear, hear.) I do not agree altogether with the idea that the United States is standing by as neutral. Certainly the people of the United States are almost unanimously in sympathy with Britain in her fight for freedom. (Applause.) Sir John French has said: "What we need now is *ammunition, ammunition, ammunition,*" and certainly the factories of the United States and the artisans of the United States are

turning out ammunition as speedily as they can. They are putting their very best skill and experience and, I believe, their sympathy into their ammunition, in order that the British army may succeed and be victorious in their fight, which is a fight not only for Britan but for the United States too, and a fight even for the common people of Germany. (Hear, hear.)

We must all, as we gather at a time like this, feel very sympathetic with the efforts of our brave soldiers who to-day are leaving their wives and children, and are tearing themselves loose from their families and all they hold dear, and giving their living bodies to fight for us, and I trust that, before this Convention closes, it will show—if it has not already done so—its sympathy with the soldiers who are at the front and who are in training.

I am very glad that you have given me this opportunity of saying a word to the Convention. Hamilton and Toronto are rivals, but they have quite a sincere regard one for the other, and we are now engaged in building a great highway, which I believe is the first of its kind in Ontario, in order to make communication easier between the two cities, and it will be a splendid thing to have that road so that in the future the Lieutenant-Governors of this Province may come down from their Hamilton homes in their automobiles instead of having to take the trains as at present. I thank you. (Applause.)

The Chairman: Is there any discussion or any question to be asked of our good friend, Major Crosby, in regard to his paper? I think Mr. Laing asked a question.

Major Crosby: My recollection is that Mr. Laing said something that might be of interest in the way of applying bituminous materials.

In the construction of a road, if you want to make it as dustless as possible, the bituminous material can be applied in two ways. The first is by mixing it with stone or gravel, whichever you are using, in a mixing plant or just off the side of the road, and then spreading on the mixed material and compacting it, which is known as the mixing method and produces a road course known as "bituminous concrete," in contradistinction from "bituminous macadam," which is made by placing the broken stone on the road, thoroughly rolling it, and then crowding the more or less porous mass with bituminous material. In the mixing method it is necessary, in order to get the best results, to have the proportions right, and so much depends upon the character of the materials used and the kind of surface desired to be secured for the traffic conditions, that it is hard to lay down any general description. If you get too much bituminous material in the mixture, the surface will not be satisfactory; it will be too soft and too likely to shift into ruts. If you get too little, it is likely to become more or less disintegrated and rutty and, as I say, the proportion depends on the conditions of the particular case.

For the bituminous concrete, the bituminous material has always to be heated, because the heavy material will not readily flow at a normal temperature, and it is necessary to use each particle of stone. Frequently the stone and the finer material, such as sand mixed with the stone, are also heated in order to secure the best results.

A Delegate: In connection with that, instead of putting this application all on top, how does the rock system compare, which is under the surface layer of stone?

Major Crosby: Bituminous material and the stone are mixed together off the road and the mixture spread on the road and compacted. In a rock-mixed system a similar process is followed, but the material used is different from the ordinary bituminous material. The rock-mixed system is similarly graded with a mixture of stone and finer particles of gravel and chemical material, which stays it and produces a form of concrete.

Now in bituminous macadam, the stone is spread on the road where it is broken to the proper grade and then thoroughly rolled, and that prolonged rolling is of the greatest importance. The stone should be thoroughly compacted but not ground to pieces under the rolling; you should get all the compaction you can without the production of too much fine material. Then the bituminous material is applied hot, so as to be thoroughly fluid and able to penetrate the voids of this layer of stone. This penetration is usually about a couple of inches in depth, and while the amount of bituminous material desirable for use will depend, in any case, largely upon local conditions, it is a fair general rule to say that about a gallon and three-quarters to the square yard is enough, provided you are using from three to four inches of this broken stone for the top course of the macadam. Sometimes, after the bituminous material is spread, a layer of screenings, or rather of chopped stone or pea gravel, is spread over the pitch-coated stone, and then the road is rolled. This layer of stone chips, free from dust, is desirable for two reasons: first, to prevent the roller sticking to the pitch; and, secondly, to furnish a certain amount of mineral material to be jammed down in the voids in the surface of the coarser stone. Occasionally then, a light coating of bituminous material, to the extent of perhaps from ⅛ to ¼ gallon per square yard, is spread over the chips as evenly as possible, the chips having been rolled and another layer of chips spread. This second coating of pitch or chips may, or may not, be desirable according to the local conditions. Personally, I desire to avoid it as far as possible.

Neither one of these conditions will produce practically any dust of itself, but it may become eventually more or less dusty because of extraneous matter brought to and ground up on its surface. For a certain time the pitch in the road will absorb the fine material brought up and hold it down, but eventually the absorptive power of the pitch has reached its limit, and thereafter, especially in the colder weather, when the pitch is hardest, the road may become quite dusty. Cleaning will relieve the situation temporarily, but not permanently, because as the fine matter accumulates again and again, it becomes dusty. However, as I pointed out in my paper, bituminous material has an advantage over certain other material in that it is capable of absorbing the extraneous matter brought on the road, although it cannot do it definitely. When one of these roads finally becomes dusty, and relief from the dust is not practicable by washing and cleaning, it is frequently found successful to apply a very thin coating of bituminous material, naturally in a very fluid state. It restores or increases the absorptive power of the pitch in the road, renews it, and allows it to absorb more dust, and that consequently reduces the dustiness of the road, so that it becomes resilient and elastic as it was formerly. These materials applied subsequently that way are generally sufficiently fluid to be applied whole, and they are applied most satisfactorily in very small quantities. To spread them evenly in small quantities requires the use of a specially designed machine, and generally machines operating under pressure produce the best results. They give a more even application, and this material, applied under pressure through proper nozzles and a proper machine, can be spread in a very small quantity, so that no objection from an excess of material temporarily on the surface can be made.

In the case of materials such as "Glutrin" and calcium chloride salts used for suppressing dust, they are usually applied by being mixed with water and sprinkled from an ordinary sprinkling cart; the calcium is mixed with water and applied just as water, or applied in a dry form and scattered like a fine rock salt over the road. The subsequent moisture coming on the road will even up any defects in the application.

A DELEGATE: How would you treat a macadam road?

MAJOR CROSBY: Ordinarily, a well-built macadam road that is objectionably dusty may be satisfactorily treated, if the traffic is not too severe, by an application of a light, fluid, bituminous material which may be applied cold. Now that material will unite with the dust on the road, and if the application is made during the first days of the spring, when the warm dry spell in June comes a slight carpet will be formed on the surface of the road, and that carpet may last throughout the dry, dusty season of the summer and fall. It will be gone by the time the wet weather sets in in the winter; if it is not gone it will produce a disagreeable, slimy coat. An annual application may relieve the dustiness under certain conditions. If, however, the traffic is so heavy that that sort of treatment is not satisfactory and is likely to result in a slimy, black coat of macadam during the wet weather of the fall and spring, then a better way would be thoroughly to clean the macadam road in the dry weather of early spring, sweeping all the dust off it, and getting it just as clean as possible without disturbing any of the macadam stone. We do not want to loosen the stone, but up to that point you cannot get it too clean. Then give it a coating of from one-third to one-half gallon of heavy bituminous material per square yard. Probably if the road never has been treated before, it would be well to give it an application of very light bituminous material and follow that with the heavy. If it has been treated before so that there is oil or bituminous material in the surface to hold the fresh material down and secure the proper penetration, the heavy material may be used without the application of a light material.

Having made that application, then coat the road as evenly as possible, and to a slight excess, with clean stone chips or small gravel about the size of peas, if it can be obtained free from the very coarse particles. Give it a light roll just once, simply to set the grit into the pitch, and open it to the traffic. That sort of process, carried out with the proper materials and properly done, will produce a coat or carpet over the macadam which, under reasonable limits of traffic, will last two or three years and give entirely satisfactory results as to dustlessness, protection of the macadam, wear, and even life itself.

A DELEGATE: What about the use of crude oil?

MAJOR CROSBY: It is not desirable for use. It contains unnecessary ingredients, frequently objectionable ingredients, and it is always better to use material which has been prepared for the purpose. Coal tars are refined and made into several products in Tarvia "A," "B" and "X." Water gas tars are on the market under the name of U-gite. I should not class Rocmac as a bituminous material; it is more of a chemical combination, not an oil. Rocmac depends on the use of a powder specially prepared which is chemically combined with the other ingredients used, and produces a distinct chemical action; it is something between the ordinary waterbound macadam and the bituminous macadam. I think Rocmac produces a more rigid surface, although I do not think it is as rigid as cement concrete.

A DELEGATE: Do you think Tarvia is more suitable than asphaltic oils?

MAJOR CROSBY: Not necessarily. It would depend on local conditions. They

all have their place; it is simply a question of finding the particular one which suits your conditions best.

Mr. Wm. Murdock, City Engineer, St. John's, N.B.: Which would you prefer, gas-works cold tar or crude oil?

Major Crosby: You mean raw tar or raw oil?

Mr. Murdock: Yes.

Major Crosby: I think it would be a choice of two evils. There is really no necessity, or very little necessity, for using either, because they are easily refined. There might be some peculiar local conditions which would justify the use of either under certain circumstances, but they would be rather rare exceptions because, when the carpet gets beyond a certain thickness, it is bound to push and shove into ruts, which are extremely objectionable, the remedy for which necessitates an entire removal of the carpet. Half an inch is the maximum thickness of carpet which can be successfully maintained on a macadam road, and in fact on any other kind of road. Continuous applications of some materials will increase the thickness of the carpet. A continuous application of some other materials does not seem to increase the thickness of the carpet; just why that is, it would be rather difficult to explain. The carpet principle has been most successful in England, but I have used it with great success over a great many miles of State road in Maryland, and I think there is a future for the carpeting principle even greater than has appeared up to the present time.

Mr. Lyons: Do you prefer 60 or 80 per cent. oil, or should the percentage be as high as that for such covering? We used 60 per cent. asphaltic oil.

Major Crosby: It would depend on the origin of the oil; 60 per cent. California oil would be different from 60 per cent. Texas oil, and quite different from 60 per cent. Kentucky oil. It would also depend upon the character of the surface to which it was to be applied. If you have an old macadam road, thoroughly bound together, very firm and nearly impervious, you have got to use a different material than you can use with success on a gravel road, which would be more impervious to the application of the oil. Again, on a concrete piece, which you wish to carpet, you would have to take into consideration the ability of the oil to get hold of the concrete, before you can decide which you want to use. I do no think any general rule can be laid down.

Mr. Lyons: Could you put asphaltic oil on concrete to smooth it down?

Major Crosby: That brings emphasis on the point I just referred to. I think that eventually concrete roads need to be coated with a carpet, but it is a rather difficult matter to do it. The asphaltic oils do not seem to adhere to the concrete sufficiently well. If applied just in the same way that they are applied to macadam or to gravel roads, they will almost invariably scale off in a little while, and a special treatment seems necessary. Good results have been secured by the application of a thin coat, followed by an application of a heavy oil, out of which the carpet is really made, but even then it is necessary to take precautions with the concrete surface before the first application is made. Care should be taken that all the enamel—if I might use the term—is removed, or you cannot get any adhesion. An ordinary concrete road is better suited to an application of a carpet after it has been in use for a year or two and the glaze is worn off the surface, than it is when first constructed, and I think, ordinarily speaking, a carpet should never be contemplated before that period.

Tar will adhere much better than asphaltic oils under ordinary conditions to the concrete. In fact, the tars are much more adhesive to other materials than are the asphaltic materials. Frequently success has been gained by an application of a light tar first, followed by an application of asphaltic material, the tar providing a greater bond between the outside and the inside. The opposite form of application has not been found successful—that is, applying the asphaltic oil first and following it with the tar.

Mr. Lyons: We have pavements that we have had down for over two years and the top is all worn off, that is why I ask the question as to whether asphaltic oil or tars should be put on.

Major Crosby: I think you would relieve the objectionable dust, without any question, by a proper application of bituminous material. (Applause.)

The Chairman: The next paper is by Mr. G. Henry, Chief Provincial Engineer, Quebec. We regret very much that Mr. Henry is ill and unable to attend, but Mr. Duchastel has consented to read his paper.

"MAINTENANCE OF ROADS."

G. Henry, Esq., Chief Provincial Engineer, Quebec.

When it is a question of comparing a number of different roads from the standpoint of economy, the most rational basis of comparison seems to be that of the cost of the "ton mile." It is well understood that this reference is to that part of the cost of the ton mile which belongs exclusively to the character of the roads. Now in the cost of the ton mile the following elements enter:

(1) The interest of the capital employed in the construction of the road.
(2) The annual payments towards the redemption of this capital.
(3) The cost of improving the road.
(4) The cost of maintenance of the permanent portion of the road.
(5) The cost of maintaining the non-permanent part of the road.
(6) The maximum grade of the hills.

All these elements are necessarily related the one to the other. It is well understood, in fact, that in building a less costly road we can lessen the costs of interest and sinking fund, though at the expense of an increased cost of maintenance; while if an economy is realized by adopting higher grades for the hills, the cost of vehicular traction will be proportionately increased. The problem to solve is evidently to construct the road with the easiest grades possible, at the least possible outlay, and so to utilize the expenditure that the cost of maintenance of both the permanent and non-permanent portions of the route should be reduced to a minimum. In considering the question of the maintenance of roads it seems first and foremost necessary to bear in mind these generalities, which we may be tempted to treat as trifles but which are nevertheless of considerable importance.

We may admit that the money used in the construction of roads is a capital of which it is necessary to supply the interest and sinking fund. Now these costs of interest and sinking fund are often higher than the costs of maintenance properly so called. There is a certain proportion to be maintained, depending upon circumstances, between the costs of the interest on the capital expended and of the sinking

fund therefor on the one hand, and the cost of maintenance, properly so called, on the other hand.

Everything considered, it is possible either so to increase the capital expenditure as to diminish the actual cost of maintenance properly so called, or on the contrary to reduce the capital cost by consenting to increase the other. But the positive fact remains that the total sum of interest, of sinking fund and of cost of maintenance has a minimum amount which it is impossible to reduce. In other words, by the very nature of things, the cost of the ton mile for each road cannot be reduced below a certain fixed limit. It is this minimum which it is necessary to endeavour to reach. There is a fixed relation between the capital and the cost of maintenance, that is to say, between the cost of maintenance and that of interest and sinking fund. Once we know their minimum total, or the minimum possible cost of the ton mile, if this expression is preferred, it remains for us to proportion the capital to the cost of maintenance by bringing it as closely as possible to the indicated minimum. As we are going to see, these two things depend largely on the nature of the ground, on that of the traffic and on that of the wearing course. These preliminaries settled, let us suppose that for a certain road the minimum cost of the ton mile to be reached has been determined, and let us see the principal points that are to be kept in mind in undertaking to solve the preceding problem.

As is well known, roads are in part permanent and in part non-permanent in character. The permanent part comprises the earthwork, the culverts, the drainage, the under-drainage, the protective works, and then the sub-base and the lower layer of the wearing course, properly so called. The non-permanent part includes the top course of the road, that is to say, the wearing course itself. The costs of maintenance should also be divided into two classes: those connected with the permanent part and those connected with the non-permanent part of the road.

But before going further, attention must be directed to certain works which should not be included in those of maintenance. Such are those of amelioration or of protection, which for one reason or another were omitted when the road was made, and which may have become necessary later; as, for instance, the replacing of old wooden bridges by others of metal or concrete, the protection of the body of the road alongside a river against erosion by means of rip-rap, and the solidification of the side slopes of embankments and cuttings. With these works may also be classed the increasing of the thickness of the sub-base to meet heavier traffic conditions. In certain cases and in certain localities the soil might be dry at the time of construction, and the foundation sufficient. Under some conditions it might happen that the action of subterranean waters would become changed, moistening the ground and rendering it necessary to drain the sub-soil and sometimes to increase the thickness of the sub-base. All these works, and others which it would take too long to enumerate, are of a permanent character and should be considered as permanent improvements. They should not therefore be charged to "cost of maintenance," but to the account of "capital."

Now that we have made this reserve, let us consider the works of maintenance of the permanent part of the road. The system of gutters, ditches, canals and under-drains should always be kept in good order so as to secure a rapid and complete drainage. As soon as rain ceases, the system of gutters, ditches, canals and drains should empty; stagnant water should never be found under any conditions. Weeds should be cut in the gutters and ditches, as well as on the shoulders. Culverts should be cleaned, also the mouths of sub-drains. The slopes of the ditches should be kept in good order to prevent caving in. It is also necessary to attend

carefully to the gutters alongside the hills where there is a rapid flow of water after heavy rains. It is much to be regretted that the drainage of roads is often far too much neglected in spite of its important bearing upon the durability of the road and the wear and tear of the costly wearing course. Too much attention cannot be directed to this point.

Now comes the question of the maintenance of the slopes along the fills and cuts, which are sometimes liable to slide. In some soils they are very difficult to maintain, and they should be drained at the time of constructing the roads. In spite of the drainage, it sometimes happens that a thaw annually produces a superficial wearing away. To remedy this inconvenience, suitably selected grasses should be sown; plantations of willows or acacias are often necessary. The acacia is particularly suitable for this purpose. Bridges, rip-raps, guard rails on embankments, mile posts, etc., etc., have also to be maintained. The maintenance of the sub-base comes under the same heading. When the wearing course rests on a light foundation or on moist ground, the foundation is liable to sink in places under the weight of heavy vehicles. All these expenses of the upkeep of the permanent part of the road represent a slightly variable annual sum, less important than that required for the maintenance of the non-permanent part. It is less burdensome because the road has been better and more solidly built.

An increase in capital expenditure, if usefully and judiciously employed, reduces considerably the cost of maintaining the permanent portion of the road, as well as of the non-permanent part, of which we are about to speak. To show better the close connection between capital expenditure and costs of maintenance, a frequent illustration may be employed. Take the case of a low-lying road, subject to inundation. The original outlay may be increased by raising the roadbed several feet, for instance, in order to keep it above high water. The additional earthwork will cost so much; the interest on this sum will be so much. It is then easy to calculate whether this interest will be more or less than would be the increased cost of maintaining the same piece of road in good order if not raised, but left subject to the damaging effect of flooding by high water. We should never lose sight, at the time of building a road, of this close connection between the costs of construction and those of maintenance.

Coming to the question of the maintenance of the non-permanent part of the road we find things more complicated. First of all it is necessary to understand what is the non-permanent part of the road. We may admit that, generally speaking, it is represented by the wearing course. In the case of asphalt roads, there is no ambiguity in the term. It is the bituminous bed, which may be as much as four inches thick; all below that is the foundation. Neither is there ambiguity when the term is applied to brick, concrete or paved roads. It is not the same thing, however, when we come to waterbound macadam. Here we may admit that the upper four inches form the top course; all below that may be considered as sub-base. When a macadam top course is worn out two inches, for instance, the wear is not regular; depressions show themselves everywhere and may sink down to a depth of four inches. It then becomes necessary completely to renew the top course by adding a new one. The first macadams were composed of stones of a uniform size throughout their entire thickness, but the crushers now employed in the building of roads furnish stones of different sizes, which have to be used. In utilizing them it is necessary to form the foundation of layers of stone of various sizes. Only the lower course in contact with the soil, formed of the largest stones, which are often unbroken, is generally considered as sub-base. The macadam,

properly so called, which is placed above, is generally composed of two courses separately laid. However, that which is in contact with the sub-base should also be considered as forming part of it, for it is rarely reached by the wheels of vehicles.

Resuming what has been said, it is preferable only to consider the four upper inches as the wearing course, and to consider all that is found below as sub-base, that is to say, as forming part of the permanent portion of the road. It may consequently be said that the costs of maintaining the top course are in some cases very high, for they represent the part of the road subject to wear and tear. The nature of these wearing courses, as well as thir powers of resistance, are very variable. Notwithstanding that certain sums have to be annually spent for their maintenance, it becomes necessary to completely renew them after a certain number of years in places where traffic, and especially automobile traffic, is heavy. It should also be remarked that they may deteriorate more rapidly in some places than in others because, for instance, of the nature of the substructure of the sub-base.

There are two methods of maintaining roads in good repair—that by means of patrolmen who make patchwork repairs as they become necessary, and that of general resurfacing. By the first method, the defects of wear are eliminated as soon as they make their appearance. By the second method, the wearing course is left to the effects of wear and tear for a certain number of years and is then renewed. The two methods are often employed together. It then becomes necessary to divide into two parts the expenditure for the maintenance of the wearing course: (1) a sinking fund to cover the cost of a new wearing course at the end of a certain number of years; (for instance, if a wearing course in bitumen costs $6,000 a mile and lasts ten years, we must provide an annuity of about $600 which may thus be considered as its cost of maintenance); (2) a certain annual amount to meet the expenses of the patrolmen who work at its maintenance. When the two methods are employed together, the life of a wearing course may be prolonged and the annuity consequently diminished, but at the same time the expenses of the patrolmen are increased.

It is often asked in what proportions the two methods should be employed. There does not yet appear to be any general reply to give to this question. Everything depends on the nature of the wearing course and the other circumstances of the case. We find in Europe old macadamized roads dating back many years, in fact to the middle of the last century, which have been maintained by the patrol system and which are still as good as when they were constructed. Others have been maintained by the resurfacing method with the same success. Nevertheless it has been recognized in France that, even when manual labour was cheap, the patrol system was more costly than the other. Since the epoch above referred to, the use of machines has been considerably extended. In certain States of the American Union, the maintenance by patrolmen has been recommended, especially in the case of bituminous courses. It may be admitted that, in a general way, the patrol system is advantageous in the case of costly wearing courses of good resistance and appropriate to traffic. In the case of wearing courses of little resistance and of cheap construction, it is better to make use of the resurfacing system. The duration of a wearing course depends, more than anything else, not only upon the nature and importance of the traffic but also upon the choice made of a wearing course to withstand such traffic.

Thus, waterbound macadam, for a traffic almost exclusively of automobiles, would be exceedingly costly to maintain if this traffic should become quite important. A course of two inches of bituminous surface, constructed by the penetra-

tion method, will also be very expensive to maintain with a traffic of heavy vehicles with steel tires. In these two cases the patrol system will probably not be economical. The top course of a waterbound macadam made with soft limestone may wear half an inch or more a year with a heavy traffic of steel-tired vehicles, and would probably have to be renewed at the end of four years. In such cases general resurfacing would be preferable. If such a wearing course cost $3,600 per mile, an annuity of about $900 per mile would be necessary, representing the cost of maintenance of such wearing course. The same course built of hard stone and capable of lasting eight years would be more economical, if the cost of this stone is less than double that of the other, for then the annuity to be provided would be less. If the price of the hard stone is more than double that of the soft stone, it may be advantageous to use the latter, notwithstanding the inconvenience of having to repair the road every four years. If hard stone is chosen, it may be found advantageous to employ the patrol system. When soft stone is to be used, the road should be divided into several sections, to be resurfaced successively from year to year in turn, so as to avoid having to renew the whole length of the road in a single season and every four years.

Since the use of automobiles has become so general and the waterbound macadam wearing courses have become so hard to maintain, whether by the one or by the other method, it has been found preferable to employ more costly ones. Among those now most used are the wearing courses constructed of bitumen by the penetration method, of which the thickness is generally from two to three inches. These wearing courses, which cost about $6,000 a mile for a width of 16 feet, may last eight, ten, twelve or more years, according to the quality of the bitumen, that of the stone, and the nature of the traffic. Suppose that one of these wearing courses lasts ten years. The annuity required in this case will be about $600 a year, if patrolmen are not employed. By employing them, the life of these wearing courses may be prolonged and the annuity consequently diminished, but at the same time it is necessary to add the cost of the patrolmen. It is easily understood that even in prolonging the life of such wearing courses by means of the patrol system, it may possibly happen that the sum of the cost of the patrolmen and of the annuity, reduced by the prolongation of the wearing course, may be higher than the simple annuity without patrolmen.

The pavements in granite and brick, and the roads in concrete are much more costly, but as they last longer they rather tend to reduce the maintenance annuity. On the other hand, being more resistant, the works of maintenance that they necessitate are much reduced, and the patrol system, which may indefinitely prolong their life and consequently reduce their annuity to nothing apart from the interest, is applicable to them. Generally speaking, with these pavements, the sum of the annuities and of the cost of patrolmen is less than with other and more inexpensive pavements.

Let us pass from one extreme to the other. There are many old waterbound macadam roads which it is sought to utilize, and which are being reconstructed. Recourse is now being had to certain means of utilizing the old, and prolonging the life of the new. Waterbound macadam offers less resistance to automobiles, but stands the traffic of steel-tired vehicles very well. To make them serviceable for either class of traffic, we now cover them with a bituminous carpet. These carpets have a short life. They last about three years, but they cost less than the wearing courses previously mentioned, and by means of them it is possible to much prolong the life of the waterbound macadam wearing course on which they are employed.

It is unnecessary to say that this covering should only be used on a macadam wearing course constructed with stone of sufficient resistance. This covering may cost from $1,500 to $1,800, as the case may be, which brings the annuity to about $500 or $600. In this case the patrol system may be employed, if the macadam is of first quality, and may prolong the life of these coverings considerably, thus diminishing by so much the annuity. Some even claim that they may be made to last indefinitely. These bituminous carpets on macadam are to be recommended when the sum of the cost of the patrolmen and of the annuity is not more than it would be with a more expensive wearing course. There are numerous examples where such is the case. Leaving aside other processes destined to increase the duration of macadam, such as the use of heavy oils, the effect of which is still less durable, but of which the price is relatively lower, leaving also aside the sprinkling with light oils, the aim of which is specially to lay the dust, let us come to a general conclusion.

When the nature of a road has been determined as well as the weight of traffic which it is destined to support, it is desirable that it should be possible to calculate for it the cost of the ton mile already referred to. Unfortunately there is still a considerable lack of necessary data for solving this difficult problem. It would be, therefore, most desirable that data should be collected in regard to the following:—

(1) The cost of maintenance of the permanent part of roads, indicating in each case whether the land is hilly or flat in nature;

(2) The life of different wearing courses without patrol maintenance, specifying in each case the nature of the wearing course and indicating if the foundation is of good quality, together with a statement as to the importance and nature of the traffic;

(3) The prolongation of life that the patrol system is liable to give to different wearing courses, and the cost of the system in each case, the cost of the maintenance of the permanent part being left aside, indicating at the same time the nature and importance of the traffic.

With such data it would be easier for engineers to make a more judicious choice of wearing courses. Useful information has already been furnished from various sources, and in particular by Col. W. D. Sohier, chairman of the Massachusetts Highway Commission; but thus far the costs of the maintenance and the improvement of the permanent part of roads have not generally been given separately, and no comparison has been able to be made between maintenance by resurfacing, maintenance by the patrol system, and maintenance by the two systems combined for different kinds of wearing courses, taking account in each case separately of the costs of the interest and of the annuity for the sinking fund and of the patrol system.

DISCUSSION.

R. H. Fair, Esq., County Road Superintendent, Kingston, Ont.

It is not a very proper time to start a discussion, because the people are pretty well tired. I did not prepare anything. I was figuring on looking into the paper ahead of me and finding considerable fault in it, and putting in the time in that way. I am a little disappointed. The paper has been excellent and in fact I would not interfere or attempt to dictate. However, it is clear, in listening to

the discussion and many of the opinions—something like what Mr. Vermilyea expressed—that the plane of the discussion and the papers and so forth, especially this afternoon, is evidently very high and perhaps a little in advance of the larger proportion of the people who are looking after the roads, and of the roads themselves. Now, we must not forget the men who live on the back lines and who do their best to look after their roads. We back up the man who is wearing the colours and crosses the sea to fight our fight. We say he is a hero and so he is; but the farmer down on the side line of the concession is a hero too, and if he did not produce crops, his country could not live. Practically, in times of war, the farmers are the men behind the men, so that in the making of Canada they must be highly considered. This question of improving the roads in Canada, I think, is one of the greatest movements that has ever been introduced into this country. There have been mistakes made, as is inevitable with new movements of this kind, by trying to force them ahead of the education of the people. The people must be educated for every big movement, and we must train them for this road movement. Some people complain that the farmers object to the expenditure, but it has been brought out pretty plainly that, if the farmers are consulted and shown that the thing is fair, you will find they are very willing to back it up. (Applause.)

My opening of the discussion this afternoon is on "Road Maintenance." I do not know that I can add very much to what has already been said. It is, of course, a very important matter. Some of our roads which were fairly good have been allowed to go to destruction, you might say; the ruts and holes do not seem to be looked after until they have completely destroyed the road. I do not think there is any man having more or less control over the roads who would act the same way towards his own buildings. I think it is just as important to keep a cover on the road as it is a roof on your shed. Any man knows how quickly his buildings will go to destruction if the roof is not looked after. The road is the same; you have to keep it crowned up, and keep it out of ruts, or the water will penetrate through. There is one thing I do notice in travelling through the country and travelling over the roads, which has been pretty strongly laid down here in papers and remarks, and that is drainage. It is practically of no use to try and maintain a road if the drainage is not good. In a great many cases you cannot tell with the eye whether the drainage is all right, but a good road man or an engineer will certainly know, and he will go farther than that; he will watch it at certain times in the year, especially in the spring freshets, or else he will make a test of it.

DISCUSSION.

CHARLES TALBOT, ESQ., COUNTY ROAD SUPERINTENDENT, LONDON, ONTARIO.

We are speaking on maintenance of roads. With the back roads the idea is to get them drained properly, and to get them graded. You need not go to the expense of buying an expensive piece of machinery, but you can go to work with a log drag and improve that road upon which there is not any more traffic than thirty or forty teams a day, and that will extend over a mileage of fifty per cent. of the total mileage of Ontario. Then we can go back to the other ten per cent. of the roads. These roads can be constructed similarly to the mud roads; the foundation is identical. You can get the material at as reasonable a cost as

possible, and upon that you can put the metal, and that road woud cost you probably $2,000 a mile. You will have a very fair road which can be maintained in a fair condition. That must be maintained at a little more expense than the mud road. Then you come to the other class, and this class would be a fairly good macadam road. The whole matter amounts to this; you must get right back to your township councils and county councils and induce these men to take more care of their highways and to feel the responsibility of their position with regard to the roads, and induce them to appropriate an annual sum of money towards the maintenance of the back roads, a larger sum towards the maintenance of the market roads, and a still larger sum towards the maintenance of their macadam roads and better roads. The more expensive the road you construct, the more money you must provide for the maintenance of that road. The higher class roads are being subjected to the greatest wear and tear and consequently you must use more money.

"ROAD ORGANIZATION."

GEO. H. HENRY, ESQ., M.P.P., TODMORDEN, ONTARIO.

Mr. Chairman and Gentlemen:

I would like to tell you why I am here to address this Convention this afternoon. It was suggested that we ought to have some discussion leading up to the question of the counties undertaking the Good Roads movement, as we anticipate in the near future that most of the counties of the Province will go into the Good Roads proposition when the Government endorses the report of the Commission which we had last year. The Committee agreed that we needed something along that line, and I, unfortunately, was the handiest man. I have not had a chance to prepare a paper, as I have been more or less a prisoner during the last week under the care of a medical adviser.

I had an idea of talking more directly to the representatives of the counties in the Province that had not as yet taken up the proposition of a Good Roads schedule. I am not in a position to know whether there are any of these gentlemen here this afternoon or not. We feel in our Conventions that we do not get very large representations from the counties who have not undertaken the work. Possibly we cannot get them here until we go and talk to them in their own counties.

Let us first, for a moment, look at our roads as we got them from the start. The Crown in granting the farms in this Province in many instances made a proviso that the property owner must maintain the highway adjoining his property. Out of that grew the pathmaster system, which had many good points in its favour, and was suited to the conditions which then prevailed. I am sorry to say that the pathmaster system is still in force in a good many parts of this Province, and we cannot make very much advance on a large scale until the councils are willing to do away with that system. In the township it is necessary to have a road superintendent or a permanent road officer. And just in passing, I do not think I would be betraying State secrets in saying that the Government is thinking of assisting and stimulating the appointment of road commissioners in every township of the Province. This is to increase a continuance of the work and give it a uniformity, to remove it from the sphere of political influence—I mean, muni-

cipal political influence, in that most of the work is delegated to the councillors living closest to the undertaking. Those of you who are present will agree with me that that system is just a revival of the old pathmaster system. We have to get away from that, and I take it for granted that you are all satisfied that it is necessary to have commissioners in this Province, to undertake the work and to carry out, in uniform manner, the bridges and culverts and grades of the highways of the municipality. That to my mind is one of the greatest mistakes we have made in the past. There has been no attempt in the average municipality to reduce the grades of the hills to any uniformity; one hill will be brought down to a five per cent. grade for part of it and the rest of it to a seven per cent. grade, and another hill to an eight per cent. grade, and they run up to ten per cent. and even higher. It is necessary for their proper improvement and for the general benefit of the travelling public that the roads of the county or municipality should have uniform grades on their hills because, after all, that is the weakest point in the road, and if we have not a good uniform grade, one that is possible to carry a fair load on, we are not going to get the results from our road improvement which we should.

Now, just in the same way as the pathmaster system has failed in the municipality, so does the municipality fail in the propagation of a Good Roads proposition for a county. Years ago, when I was a county councillor, I was firmly of the opinion that the township council should be aided by the Government and that we should have all the systems directed by the municipality and do away with the County Systems. While I am still of that opinion, I understand that we can only get the best results of our expenditure by being closely connected with the work. The more removed we have the expenditure from the people, the looser the expenditure is and the harder to control, and I find that, in municipal organizations where they have good superintendents who are closely connected with the work and the expenditure, they can get more for the money than can a County System.

At the same time, it is necessary, in order that we may have uniformity, that we extend this work into a County System. I would not suggest for one moment to the Provincial authorities that they should go into any smaller units than the County Systems. The strong will help the weak. Municipalities do not live unto themselves, neither do counties, but at the same time the county is a very large organization and intercourse between counties is not any more difficult than intercourse between municipalities in the same county. The strong helps the weak, first in its ability to pay; that is, a wealthy municipality helps the less favoured to improve its highways, which are of general public interest. A municipality with light traffic will help the one with heavy traffic, so that the burden will be spread over the two, in the same sense as we have worked it out with regard to large bridges. I do not suppose, Mr. Chairman, there is anybody present who would ask the Legislature to pass an act that all the bridges in the Province should go back to the municipalities and that there should not be any County Bridges. We all agree that there should be County Bridges; the larger structure should be maintained by the county, thereby to relieve the minor municipality. Just in the same way should the main highways of the county be constructed and maintained by the county, to relieve in that way the congested sections where there is a burden in attempting to keep up the main travelled highways to a sufficient standard. Then there is that same uniformity developed throughout the county that you have on a minor scale in a municipality by the use of road commissioners. Besides, counties are able to get more up-to-date machinery, and they are better

able to purchase what is required for the proper improvement of their highways. Then last, but not least, the Government says that you must go into County Systems if you wish aid from it, and just in passing I suppose I may say that, while I am not allowed to divulge State secrets, I hope and expect that before this Convention adjourns, the Government will have brought down their proposition with regard to Good Roads for the future and I trust that it will be a comprehensive one, and that the people of the Province will take hold with a willing hand, and that we will have a big expansion in the very near future. (Applause.)

Now I want to say a few words to those, whom I hope are here, who are going into the Good Roads schedule, or those who are going to increase their schedule in their own county. It is necessary for them, in order to have real satisfaction, that they approach the question in the broadest light possible. If you find in your county council men who are trying to get the cheapest work done, if they are going to have much say in the working out of your schedule, your case is almost hopeless. The members of the councils must be big enough to become county representatives; they must get out of themselves and not get the idea that they are representing a small village or a small corner in a mining municipality. The schedule is possibly one of the most important things that the county undertakes, once it decides to go into the Good Roads proposition. The schedule must take, of course, cognizance of the local conditions in each part of the county, but it must peremptorily look toward the market centres. If there is one argument more than another in favour of the improvement of the highways, it is for the improvement of transportation facilities to our market centres, and the county, therefore, must take into its most serious consideration the market centres, and lay out the roads which will do the greatest good to the greatest number of people in the county. While the Department calls on you to have a continuous system, I feel that it is in accord with those who wish to develop the roads leading out of the centres, on which the traffic moves into their market town. But above all (and this has been—I won't say a fatal mistake, because I don't think anything is fatal in a road proposition—but it has been a very big mistake in the past), the counties have overloaded themselves in their schedule. They have almost uniformly too much mileage at the start. It is better for you to start off on a small mileage and increase it afterwards, than to start off on a large mileage and find you have to issue debentures three or four times before you complete your system.

A word to those who are going into the proposition. When should you start? My answer is, Now. It is necessary for the counties, if they are going to take part in this development of the roads of the Province, that they get to work immediately. At the joint sessions of the county councils there should be a very warm discussion as to what they are going to do about the road proposition in different parts of the Province. I know what county councils are like in November; they do not do anything but clean up odd ends and talk about who is going to be Warden next year. That is no time for a new proposition, and the road proposition is one of the things that is tabooed. Now is your time; get to work in June. Appoint a committee and seriously discuss the proposition; if you don't get a schedule formed this year in time, it may take you the whole of 1916 to do so, and in the meantime, while I do not know just when the law is going to be put into force, those who are ready when it is, will get the benefit.

Just a few words in closing with regard to what keeps county councils out of the proposition. It is largely a matter of fear on the part of a councillor that his constituents won't return him to office the following year, because he feels that the

average ratepayer will be afraid of the expense. The councillors should not fear a proposition on the ground of expense. There are a great many different classes of highways, as Mr. Talbot has told you. It is not necessary or possible for us to build all the highways or main highways in the county of macadam construction; there are many first-class highways in the Province built with good grading and the application of a good gravel. With a little care and attention in the spring and fall, that highway will stand for many years with very little expense. Of course you can go into larger expenditure by putting down a macadam road and spending from $5,000 to $8,000 a mile. My experience has been that, if your expenditure has been reasonably efficient and the ratepayers see results, they never say no. The people living on the highways never object, and I think that the people who don't live on the highways are not objecting, because they all get to these main highways and have the advantage of a good road. Then it is not well for counties to estimate what their expenditure is going to be and to tell their ratepayers that this is going to complete their system. It is almost impossible to estimate what will complete any given system; you start a system of say fifty miles, and build ten the first year, having carefully estimated the traffic and conditions that you are going to work under, and what do you find in the end? Before you get ten miles built, you have a revolution of the traffic. The people will make for that road for miles, and you have built a road quite capable of handling the traffic you estimated, but entirely unable to cope with the traffic you have brought on it. Then you find you have not been as wise as you should have been, and you think the next ten miles will be of a better character. And still I say, the ratepayers of the county will not say no, if you are really getting good work for your money.

Now, Mr. Chairman, just a thought or two that came to me as the last speaker or two were making their addresses. Mr. Talbot said that we have been discussing main highways with permanent surfaces and of permanent construction, and that we were not dealing with the township roads. I was not present all afternoon or very much, due to other duties of the Session, but to my mind you cannot improve the township systems until you improve the County Systems; it is all right for us to tell the townships to improve their roads; they won't do it until they have an example close at home on which they can work. My experience with the township has been that, with the limited amount of money they raise, they spend all they get hold of on the main highway, that is on the road that should be the County Road. It is not because they do not want to improve the back roads, but it is because they have not any money. The money is sunk in the road that everybody uses, and it must be kept in a fair state of repair. Once you relieve the municipality of the maintenance of the main roads, it will improve the other roads; it will not reduce its expenditure; it says, "We can improve the back roads when we are freed from the charge of looking after the main highways." Then it has the incentive and example of what Good Roads will do. There is nothing like an example. You can talk for years to a man about a good highway; but if he does not drive over one he does not appreciate it; once he does, he is anxious to have a little more in his locality.

What is going to be the result of this year's work is hard to say; it is not likely that we are going to have a great deal of expenditure in the Province this year, although I trust that the parties who have been working will go along this year as in former years, but I think this is a year for organization and getting ready for the future, once things settle down and we get rid of the troubles we

have across the waters. We must be ready to improve conditions of farm life in this country and that, after all, has become the live topic with the people of the Province. The citizens are going to be asked to improve the highways outside of the centres in which they live, and they are taking an interest in the proposition, and if those outside will only get ready and have their schedules worked up and their counties ready with organization, once the Government says they have the necessary financial backing, there won't be any trouble about great improvements to our main market roads in this Province.

I am very much pleased to state that we are going to stick by the County System. I have had many talks with the Minister of Public Works, and he is firmly of the opinion that the County System is the system for the Province. There are some special roads and they are going to prepare for them with special legislation, but the main sphere of the work they wish to undertake is the improvement of the County Roads throughout the Province. We are going to stay with that proposition on a little more favourable basis than what we have had up to the present time.

Before I sit down I must voice a feeling I know you all have, regret that Mr. McLean is not present with us. He has been working very hard for this proposition, and it must be very hard for him at the present time to know that this subject, to which he has given so much attention and energy and to which he has been looking forward for the last month or two to taking part in at this Convention, is being so thoroughly discussed and that he must be a prisoner, entirely unable to take any part in it. (Applause.)

Mr. Parsons: I wish to move this resolution:

"Moved by J. J. Parsons, seconded by George Hammond: That this Convention approve of the recommendations contained in the Report of the Provincial Highway Commission, and that in the opinion of this Convention, the interests of the Good Roads movement in Ontario demands an early declaration of the Government's policy in reference to the construction and maintenance of County Roads. And that this resolution be referred to the Committee on Resolutions of the Ontario Good Roads Association."

SIXTH SESSION.

Thursday Morning, March 25th, 1915.

S. L. Squire, Esq., in the Chair.

"ROAD LOCATION."

C. R. Wheelock, Esq., County Engineer of Peel.

Location is the first thing to be considered in planning a new road or a road improvement, and as it is the most permanent thing in connection with the road it is probably the most important. The best of surfacing materials will in time yield to the wear and tear of heavy traffic and the action of the elements, and must be renewed more or less frequently, but the location and grade of a road once properly established become more fixed as years go by.

The establishment of location and grades should have the most careful consideration; a thorough examination of the locality should be made by an engineer with a well developed faculty for recognizing suitable road locations, and all the conditions in connection with construction, drainage, grades, maintenance and traffic, thoroughly investigated. The first considerations in the choice of locations should be the most direct route, easiest grades, and minimum cost of construction and maintenance.

Roads in Canada, with few exceptions, have been laid out to follow property boundary lines regardless of the topographical conditions of the locality through which they pass; and, as these lines are generally unsuitable, the result is that most of our Canadian roads are poorly located and of the most expensive description both to build and maintain. Hills are encountred, where a small detour would have given a level road; swamps and bogs are crossed that could easily have been avoided; bridges have to be built at poor locations, when places requiring shorter spans and having fewer engineering difficulties could readily have been found; and in many cases the length of the road is increased by being indirect between important points.

Upon a careful examination of the locality and conditions, it may yet be found practicable to remedy many of the above mentioned defects. In some cases the expenditure of a small sum for land will provide for a detour around a hill which would cost much more to cut to a proper grade, or around a swamp where drainage difficulties exist and an expensive foundation would be required to support the surfacing, or perhaps a change of location of a bridge might be desirable. In considering the benefits of such changes the matter of maintenance should be taken into account. This saving alone may often be sufficient reason for making a change.

Municipal councils are authorized to alter the locations of roads, in a manner fair to all parties, and it is advisable that the power be judiciously used. In all cases when land is acquired for the purpose of road improvement, an accurate survey should be made and a correct description provided, in order that such land may be conveyed to the municipality by a good and sufficient deed.

Probably the first matter to be considered, in order to determine the amount of work to be done and money expended, will be the amount and nature of the traffic that the road will be asked to take care of. This must not be based on a present traffic census, for as soon as the road is improved the traffic increases so greatly that all former traffic data are of little or no value, and the greatest fore-

sight is required in making estimates. The unimportant road of to-day may be the important road of five or ten years hence. Local points, between which the greatest amount of traffic has existed in the past, are no longer the governing factors in the value of a road. The improvement of main roads must be considered as a whole, one link in a chain of improved highways. Uniformity in construction and co-operation between counties are most necessary to bring this scheme for a system of improved roads to a successful issue.

Pioneer roads in Canada, in passing along the allowances, generally followed the line of least resistance, avoiding stumps, logs, large boulders, etc. Many of these roads still follow the same old winding lines, although the obstructions may long since have disappeared. The roads now being built should be a permanent foundation for all future improvements and, before grading is commenced, should be carefully located in the centre of the allowance. If the boundaries or limits are not well defined by posts or fences, a survey should be made by a competent person and the road allowance properly located. The graded-roadway should be straight and located in the centre of the road allowance. To delay straightening roads means that much of the work now being put on them will be torn up when the straightening is undertaken. Keep the earth grade in the centre of the road allowance and the metal in the centre of the grade.

Detours of the road should be made with curves as easy and the driver's sight-lines as long as circumstances will admit. With horse-drawn vehicles a fairly sharp curve is not objectionable, but the high speed of the motor vehicle makes a necessity of easy curves and long sight-lines as an ordinary provision for the safety of the travelling public. Curves should have a radius of not less than 100 feet when practicable, and a sight-line of not less than 425 feet. All sight-blocking obstructions should be removed.

The determination of the grade lines to be established should depend largely upon the amount and nature of the traffic and the topographical conditions of the locality, but unfortunately the foremost consideration has too often to be the amount of funds available. It is generally agreed by engineers and roadmen that the maximum grade on main highways should not be more than 5 per cent., but this may not always be found practicable. The maximum allowed by the regulations under the Ontario Highway Improvement Act is an 8 per cent. grade. It should, however, always be kept in view that, to have our roads up to the standard adopted by both the United States and Canada, the grades on main or trunk roads should not exceed 5 per cent. Steep grades increase the cost of transportation; no greater load can be moved over a highway than can be moved over the maximum grade. The cost of maintenance increases very rapidly with the increase of grade and is a very important consideration. It is roughly estimated that the destructive effect of heavy rains and spring freshets is four times as great on a 5 per cent. grade as on level ground, and nine times as great on a 10 per cent. grade as on the level. It is not, however, on account of drainage considerations, desirable or economical to have a perfectly level road to obtain the best results. The minimum grade should be about one-half of 1 per cent. On a stretch of road with a general ascending grade continuing to a higher elevation, descending grades should be avoided as much as possible, and *vice versa* where the tendency is a descending grade toward a lower level.

In conclusion, I would say that for many years to come metalled or surfaced roads in Canada must be limited to a small percentage of the total road mileage; for every mile of surfaced road that is built there will probably be eight or ten miles of earth roads. Is it not, therefore, a matter of the greatest import-

ance that these earth roads, which form such a large percentage of the mileage of our road systems, should be given more attention? In the past the questions of location and grade alignment in connection with the construction of such roads received little or no consideration. Earth roads properly located and graded can be kept in good shape for light traffic and, when located and built on correct principles, will serve as a foundation for all future improvements.

THE CHAIRMAN: I have wondered if the Convention appreciates the area of information and the number of eminent speakers we have had at this Convention. I believe I am speaking within the limits of truth when I say that we have never before had a gathering meet together in any convention of this description in Canada with the same number of men who have been able to advise us along lines of road construction, and who have been able to give us of their rich experience.

I mentioned at the commencement that we did not always stick strictly to our programme. We now have a treat for those who are present. We have with us Mr. N. W. Rowell, the Leader of the Opposition in the Ontario House, who is known to most of you, and we will ask him to speak to us for a few minutes at this time. (Applause.)

ADDRESS.

N. W. ROWELL, ESQ., K.C., M.P.P.

Mr. Chairman and Gentlemen:

I came here this morning, not for the purpose of imparting instruction, but to receive some instruction. I judge that most of those interested in the Good Roads movement feel that the education of the members of the Legislature constitutes a not unimportant part in your programme. I am glad to be here, and to have this opportunity of congratulating the Association on the splendid Convention you are having, on the influential representation which has gathered here from all sections of the Province. I suppose anyone who has ridden over a good road and a bad road does not need to be told the comfort and advantage of a good road. In the constituency which I represent we have a number of County Roads which have been improved under the Highway Improvement Act, and we have a number of other roads which have not been so improved. I remember having a somewhat arduous campaign in the month of December three or four years ago, and I learned to appreciate by practical experience the advantage of Good Roads, especially in bad weather.

The question of Good Roads is interesting, I think, to the thoughtful people of our Province, as well as to the Members of the Legislature; not only the people of this Province, but all communities on this continent are interested in the question of the relation of rural to city life, and the drift of population from the country to the city. We are all commencing to realize that there is no more serious problem confronting us than seeking to arrest this cityward tendency, to develop more largely rural communities, and to help stimulate and develop, more fully than we have in the past, rural life. I can imagine no single factor of greater importance than the question of Good Roads. That fact has been borne in upon the minds of men interested in the problem, not only in Canada, but in the United States.

I know that some two years ago, when I first commenced seriously to look into the problem of Good Roads, I was intensely interested in seeing the progress that has been made in a number of American States in the Good Roads movement, and the amount of public money and municipal money that was being expended on the improvement of highways. In travelling through Great Britain and on the continent, in France and in Germany and Switzerland and Italy, one cannot but be struck with the remarkable difference of the roads in these countries, compared with the roads in our own Province or in newer countries. It is not to be expected that in a new country like we have, we could have the same character of roads that they have in these older and more thickly populated communities, and yet, it is nevertheless true that a great deal of the best road construction in some of the European countries has been done within the past fifty years. The development of Good Roads in these countries has been taken up seriously as a governmental proposition, with the view of securing the best system of transportation throughout the whole country.

I am sure the Members of the Legislature interested in the welfare of the Province, irrespective of party, are deeply interested in the deliberations of this body, and I am sure that whatever representations you make will receive most sympathetic consideration at the hands of both parties in the House. The Good Roads movement was started by the party in power before the present Government came in. It has been continued by the present Government, and I believe that the members in the House are sincerely desirous of doing what is best in the interest of the whole Province. I hope this Good Roads movement can be kept entirely free from any party feeling—(applause)—and that we may, as a united people in this Province, be equally interested in the development of the best interests of our Province and work together to do that which is the very best for all the people in the Province of Ontario. I am glad to have had this opportunity of coming in and meeting with you. (Applause.)

THE CHAIRMAN: If there is one keynote that has been struck in this Convention that we should carry home with us, it is the word "Co-operation." The Good Roads programme admits of such broad and diversified talents that we have got to bow to both the engineer, the business man, and the legislator. They are all asked to do their share.

DISCUSSION.

J. F. WHITSON, ESQ., COMMISSIONER OF NORTHERN ONTARIO DEVELOPMENT, TORONTO.

Mr. President and Gentlemen:

I regret very much that I am not prepared to discuss this paper at any great length. I can agree almost entirely with what Mr. Wheelock states in his paper. I think one of the most important, if not the most important part of road-building, is the selection of the road. I was glad to hear Mr. Rowell make some very important remarks with reference to leaving out party politics in road construction. (Applause.) If there is one thing in the past that has injured road construction in Northern Ontario, not only with one Government but with others, it has been

party politics. I am glad to say that in my short term of office party politics have been almost completely removed from road work. When I started in three years ago, I was a little afraid of the future. I knew what politics have done in road construction work in the north for the last twenty-five years, but I am glad to say that during the last three years party politics have not interfered with the construction of roads. (Applause.) In our work we know no man politically, and I hope that state of affairs may continue. If it does not, it will greatly hamper the road construction in Northern Ontario, as it has in the past.

Mr. Wheelock referred to the fact that all clay roads have not yet been built. Speaking for Northern Ontario and the clay belt, I might say that all our roads for the future will be clay. There are dozens of townships in which not a single load of gravel is available. The Grand Trunk Pacific have had to haul their gravel sixty miles in some cases. The roads in that country for many years to come will be nothing more or less than clay roads. The only hope we have is that they will be well drained, and then for at least three or four months in the summertime we will have first-class roads. Early in the spring and late in the fall, during the wet season, our roads will break up. I have found, in taking charge of road construction that a great many of the old roads have been laid out with very little care. Many of them followed old lumber or tote-roads. The lumber roads followed the low land, so as to make an easy haul for the logs in the winter, and the tote-roads for taking in the supplies in the fall followed the high land. We had the two extremes, the high land and the low land. Many of these roads have to be abandoned altogether, more particularly those that follow the ridges. Therefore I agree in every respect with what Mr. Wheelock has stated that the most important part of road-building is in first laying out the road. I shall not detain you further, but will conclude with thanking you for your kind attention.

"GRAVEL AND STONE ROADS."

CHARLES TALBOT, ESQ., COUNTY ROAD SUPERINTENDENT, LONDON, ONTARIO.

Almost the total mileage of Canadian roads that have been improved are metalled with gravel and, where a reasonably good quality of material is available and traffic conditions are not excessive, there is no reason why it should not continue to be used by road-builders.

So much has been said about a properly prepared grade and the necessity of thorough and systematic drainage, that one is inclined to believe that all those constructing roads are building their grades properly and taking the necessary precautions to secure proper drainage. I will assume this to be a fact and will not touch the subject in this paper.

Before starting the construction of the road, one must ascertain, as nearly as possible, the amount and nature of traffic that must be provided for. Having ascertained this, and making large allowance for the increased traffic always resulting from the improvement of a road, one is in a fair shape to determine the width of the grade and the depth and quality of materials to be used for the work. The average country road leading to market centres carries from 50 to 250 vehicles of all classes per day. Side roads and concession-lines leading to the market roads, which constitute possibly 80 per cent. of the total road mileage, are subjected to

a traffic of less than 50 vehicles per day. The latter class of road, properly drained and graded and metalled by placing 400 to 800 yards of stone or gravel per mile, will give good results.

The grades on these roads will necessarily have an excessive crown when constructed, for it is quite useless, for the present at least, to expect road rollers to be used in their construction. Few township councils own rollers, and those owned by the county are almost always in use on county work. The consolidation of the gravel and metal can be assisted in large measure by the use of the split-log drag or grader. In localities where gravel is available, the construction of such roads present no serious problem to a township council. Where gravel is not available, they may be maintained in excellent condition by the systematic use of the split-log drag, always assuming the grade is properly constructed and drained. The serious road problems are to be met on the main roads, where traffic is increased to 100 to 250 and more vehicles per day. Here the necessity arises for a deep foundation. Especially is this the case where the subsoil consists of rich loam or heavy clay. Sand and dry porous clay or loam subsoils overlying gravel deposits, affording good natural drainage, will require less metal. Thus in different parts of even one mile of road, methods of construction must vary materially if economy is to be exercised. The average market road should have a grade 28 feet wide. Ten or twelve feet of the centre should be metalled. The material to be used will necessarily depend upon the supplies available.

Where gravel is plentiful and of good quality, it should be screened, or if very coarse run through a crusher, and placed in position with the heavier material or tailings to a depth of two or three inches placed in the bottom. The more uniform the material for the base, the better results. After the base is consolidated with the road roller, the gravel that has had the excess of sand removed should be applied in layers, and each layer consolidated until the required depth is obtained. Sand may be used with advantage to bind the surface. In preparing the grade for the gravel, it should be slightly trenched in the centre, and after the gravel is laid the outer portion of the grade should be turned in to bank the gravel, and thus form a grade with about one inch to the foot of a crown on the earth sides and ¾ inch per foot on the gravel or a total crown, after gravel is consolidated to position, of 12 or 13 inches from the shoulder of the grade to the centre of the road metal.

In the construction of a gravel road I am of the opinion it does not pay to attempt to consolidate the gravel surface to a hard finish but only sufficient to prevent uneven and excessive settlement. If this is done and the road properly maintained, there will be little inconvenience in travelling the road and the traffic, with a liberal use of the road scraper, will soon produce the finished surface. This construction will require 2,000 to 3,000 yards of metal per mile, and will vary in cost almost directly in proportion to the distance of the gravel pit from the works. Such a road will cost from $1,500, where the pit is within one or two miles from the road, to $4,500 per mile for gravel ten miles distant. I am of the opinion such a form of construction is not economical, and would refer you to the paper prepared by Mr. Van Scoyoc, Engineer of the Toronto-Hamilton Highway Commission, and I think the conclusion you must arrive at is that, where you are contemplating the construction of an entirely new road including foundations, concrete construction is more economical and effective than either gravel or stone.

In localities, however, where old gravel and stone roads have been constructed, it is cheaper to use gravel and stone to maintain them. In deciding such matters, I conclude that, if an expenditure per year amounting to the interest on the

capital required to construct or reconstruct a road will maintain it in such a manner as to constantly improve the road so as to meet the increased traffic, it is quite proper to use the money in this manner rather than to reconstruct the road or replace it with a more expensive type of construction. Many a good road has been and is being allowed to be destroyed for the want of a proper system of maintenance, and those having charge of such affairs blame the deplorable condition of their roads upon the methods used in construction, instead of telling their ratepayers they thought it more advisable to keep down the tax rate than maintain the roads in a serviceable condition. It is almost impossible to induce the average councillor to set apart an appropriation for the maintenance of a good road. Is it any wonder then that the Legislature has concluded that it must relieve the townships of the control of the leading roads, if the people are to enjoy an economic administration of their main highways?

The roads of lesser traffic require little maintenance after construction, and the township councils will presently realize they must respond to the demands of the people in the construction and maintenance of good and sufficient roads or, sooner or later, their responsibilities will be further curtailed by the Legislature. I am pleased to note that in many localities the township councillors are responding to the educational campaign being conducted by the Ontario Highways Branch. In these localities the county councils must take an advanced position, or the township highways will be in as good if not better repair than the County Roads; and this is as it should be, for a back road once properly constructed requires a very small expenditure for maintenance, while the main roads require large expenditures for construction and liberal allowance for maintenance, if they are to be kept in proper condition.

But in this I have departed from my subject, and must return to the construction of the stone road, and this construction is, after all, identical with that of the gravel. More economy can be used in the placing of the stone as the binding qualities of the crushed material is much superior to that of gravel, and consequently a lighter base may be used. Eight inches in depth of consolidated stone makes a good road for country traffic. Where the rock is available for crushing adjacent to the road, the cost will not exceed $2,000 per mile. Where material is shipped from the quarries, the roads near the stations can be constructed for $2,800 per mile, and this cost will increase in proportion to the increased cost of delivering the material to the districts distant from the quarry and the station. A road five miles distant from a railway station will cost approximately $4,500 per mile, if constructed eight feet wide. Where stone is being laid upon an old gravel road, less stone may be used and the cost may be reduced by 10 or 15 per cent., depending on the depth of gravel or stone in the old roadbed.

While it is possible, but not advisable, to build a gravel road without the use of a steam roller, it is a waste of energy, time and money to attempt the construction of stone roads without a proper equipment of road machinery. After the necessary machinery is secured and the grade 1½ inch to 2½ inch previously prepared, stone is placed in the base of the trench to the required depth and rolled, until thoroughly fixed in position, over the heavy stone. Spread a thin coat of stone up to 1½ inch, sufficient to fill the voids in the surface, and fill the depressions resulting from the continued operations of the road roller. After the surface is free from waves and depressions, sufficient dust (screenings under ½ inch) to form the necessary binding is evenly spread over and worked among the stone. This is thoroughly soaked with water, and the rolling and watering continued until the surface puddles in front of the roller wheels.

Special care should be taken to prevent teams driving upon the stone after it is laid and, before rolling is completed and in spreading, to see that there are no depressions or waves in the finished road; otherwise the surface will be uneven and objectionable to drive on and depression will become more pronounced as the road wears under continued use.

A DELEGATE: What do these gravel roads cost?

MR. TALBOT: About $1,500, if the haul is not more than one or two miles, and the price will increase as the haul is increased.

A DELEGATE: You speak of three hundred vehicles per day. How would you proportion the automobile traffic with the horse traffic?

MR. TALBOT: You will have to do that by taking a census.

A DELEGATE: How many vehicles would be equal in destructive power to one automobile?

MR. TALBOT: It would depend on the automobile. I am not in sympathy with the idea that the automobile is a tremendous destroyer of roads. Some people will tell you that an automobile will get into a rut and throw the dirt all over the place, but I never saw an automobile driver who did not steer clear of these ruts. However, if you have a road with mud holes in it the automobile gets into them, but if you look properly after your road there is no reason why it should have these miserable depressions. (Applause.)

A DELEGATE: Hasn't the width of the tire something to do with the wear and tear of a road.

MR. TALBOT: Take a road that is adjacent to a milk factory and you will have one of the most abominable conditions to contend with, because they will travel on that road with a ton of milk in a light wagon, and that cuts the road to pieces. Until we can get some legislation to control the width of tires it will be impossible to maintain a waterbound macadam highway, because the rain softens the surface and the tire will cut it to pieces.

A DELEGATE: Will you kindly give us your idea of tile drainage.

MR. TALBOT: That is a very large question, but if you will take land that requires to be drained in order to produce a proper crop, then you cannot expect to build a road on that land unless you under-drain the road surface. If you have surface water to contend with, a tile drain in the bottom of the side ditch will answer almost every purpose. As the wet season approaches, you will notice pockets in the road where it is going to break up in the spring, and if you tap that you will find a deposit of sand or open subsoil, and that the water has been prevented from getting out by a bar of clay. The best way to remedy that is to tap it with a tile drain to your side ditch. I admit that will be somewhat expensive, but you cannot build a road in a year. If you continue on in this way, you will eventually have your roads properly drained.

A DELEGATE: You spoke of putting a cover on roads that are travelled up to 50 vehicles a day, and you spoke of putting 100 or 180 cords of gravel to the mile. Would you place that gravel on the road before rolling it?

MR. TALBOT: I presume that on most of these roads you will not have a roller, because the majority of township councils do not own a roller.

A DELEGATE: What depth of stone do you figure you can successfully roll? In building some roads they put on from 8 to 10 inches and then try to roll it. Can that be successfully done?

MR. TALBOT: I have successfully rolled 8 inches of 3-inch stone.

A DELEGATE: You cannot roll 5 inches of stone successfully.

MR. TALBOT: I suppose it would be better to roll a less amount.

A DELEGATE: I am inclined to favour the opinion of the gentleman who has just spoken that 5 inches is about as much as you can roll successfully. In my work last summer, I found we could do better work by putting on 4 inches of stone and then rolling it, and then putting on another three inches.

MR TALBOT: In the majority of counties they are not organized up to the finish, and in some cases they have only one roller in the county. It may not be advisable to roll 8 inches at a time, but sometimes you have to do it. We cannot control the county council, and I believe the county council should be the absolute bosses of the job. Let them suffer and let them learn by experience; what the engineer has to do is to advise them.

A DELEGATE: We make it a rule in our county to roll 4 inches or less at a time.

MR. TALBOT: There is no doubt you get better consolidation and get it more quickly, but we have been in the position that we have not had a sufficient number of rollers to have the roller on the job all the time. You cannot always get this business down to a science on account of the conditions you have to contend with.

A DELEGATE: Do you think it is any advantage to have a commissioner to attend to the work?

MR. TALBOT: All the reeves have not had the necessary experience to look after the work, but there are exceptions. I had some foremen on our roads that were good men, but we had others that we were glad to get rid of.

A DELEGATE: Do the road commissioners work under the instruction of the reeves?

MR. TALBOT: I do not think so.

MR. BROCK: It is rather misleading to plan your road on any figures of the amount of traffic passing over the road, because as soon as you get the road improved and it is better than the other fellow's road, then everybody in the county comes and uses it. The only rational basis for planning a road is a census of the population in that part of the country. I simply offer that by way of criticism.

I got up to commend Mr. Talbot's paper. He said yesterday we were not getting down to the practical side of road-building. He is the only man I have heard here broach the subject of sub-draining the road work. It is perfectly evident to experienced road-builders that that is the place to begin: Telford really became famous because he put his road on stone stilts, so that it was on a continuous culvert from one end to the other. We have not that amount of stone in all parts of the country, and for that reason the drainage idea has been overlooked.

Mr. Allen read a very excellent paper and he stated that the weakest point was in determining the value of a road to a community, and yet he almost slighted the weakest point, which is not the great bridge that we engineers are so interested in designing, but the little old pipe culvert that you come to every quarter of a mile. The railroads on this Continent have found that it is expedient carefully to drain every wet spot along their road. If you go to the Panama Exhibition on the Santa Fé Railway you will see that they recognize that the drainage of the road-bed is most important. It is accomplished by buying a lot of second-hand or second-grade clay sewer pipe and burying it in the drainage field with stone, without putting any cement in the joints, so that the joints are left open. In that way the water is

carried off and the road is left dry. The same treatment has got to be carried out in wagon-roads to get the same results, and it is simply a question of whether you will lay the drain tile on each side of the road or one in the middle, or whether one will do.

The matter of culverts has been carefully overlooked by most of the speakers, I suppose for much the same reason as I might have in preferring to have been the engineer on the Quebec bridge, and not on some insignificant piece of work, or in being engineer of a transcontinental railway rather than of a local belt line. The same tendency is evident in all other engineers. The old culvert is such an old-fashioned and uninteresting part of road engineering that we have all carefully avoided it. Another difficulty is that, if we were employed to design an old clay pipe culvert, the design would cost more than the culvert. That can be overcome by taking a good look at the road and, when your field men come into the office, they will give you the location of every stream, the watershed which each one of these streams drains, and the height of the road over the bed of the stream. With that information, you can get the diameter of all the culverts, and, having once secured this information, you can easily fix the length and diameter of every culvert on the road, and you can make one blue print which will do for them all by simply changing the dimensions. You can sit in your office and order the necessary materials for the culvert, and it is up to you to see that the people who build these culverts put them in on the natural level of the stream, and that they do not dig a hole in the ground and bury them. The stream has the right of way when it crosses a road. If there is not room for the road and the stream in the same place, the road has got to be elevated, because the stream will get the right of way, whether you give it to it or not. Engineers have no excuse for neglecting this important matter of culverts, because the road depends on the drainage.

DISCUSSION.

H. D. Cleminson, Esq., County Road Superintendent, Picton, Ontario.

Mr. Chairman and Gentlemen:

In considering the kind of road you are going to build, there is another question that must be taken into consideration, and that is the amount of produce that has to go to market from a certain section of the county over that improved road and the time of year that that produce will be delivered to the market. It is very easy for one who is familiar with the conditions to decide on the kind of road, the width of road, and the manner in which it should be built to carry the traffic. We have five market towns, two of them being outside the county. One is the City of Belleville, in the County of Hastings, and another the Town of Trenton. One of the speakers said that there should be co-operation between the counties. If we build a good road to take our produce to the market town, to Belleville, we get the worst piece of road from the boundary of the City of Belleville to the market, and the people from the western part of our county have an almost impassable road to Trenton. It is absolutely necessary to have co-operation in these matters, and two County Road Systems should be joined so as to make a continuous good road for the man who has to travel from one county to the other. If the bad road is at the

end of his journey then he cannot draw any heavier load over the good road than he can over the bad.

One of the first points to consider in building a road is the grade. A great many foremen cut the shoulders off the road, and, instead of throwing it entirely out of the road, they throw it in the centre of the road in order to make a crown, and that is a mistake. In most township work they follow the line of least resistance; it is easier to take the stuff off the side of the road for the material that is wanted for the crown. We make our roads from 28 to 32 feet in width, that is to say, for the grade.

We have not many clay hills, or springy, sandy roads in our county. It does not make any difference how well you drain your road with surface drainage and carry it to the stream that runs across a man's farm, you must carry the drainage further than the edge of the road. You must have the co-operation of the owner of the land lying along your road, so that the water will get away and not back up alongside the road, because if the water lies there the natural drainage of that water is to the centre of the road and, unless the centre of the road is dry, it won't stand up.

The question was asked as to the amount of metal that could be put on a road and successfully rolled. We have put 12 inches of gravel on a road and we have rolled it, but not successfully. We have now stopped doing that. One fault we found was that we could not consolidate the bottom, and that tended to make the road fall down and flatten out more quickly. It is much better to roll the road in layers than to do it all at once. When we start our gang out, we put a complete outfit on the road. The minute the road is graded we put the roller on the road, and the minute a load of metal is put on the road the roller commences to work. The people will not stand for the disadvantage of travelling over a long line of metal 8 or 10 inches deep, and wait till the roller comes from some other road. We roll the road and then put on the top dressing. We spray the road with water and we brush it in. In order to help fill the void, we keep the roller on the road until the screenings and the binding on the top of the road will shed water, and even after that, before the traffic comes on, it pays to keep the roller going over the road. We keep on rolling as long as the machine is on the road, and if possible the roller should be left on the road for four or five days after the last piece of it is completed.

Road-building is about one-tenth an engineering proposition and nine-tenths a business proposition. One mistake we make in judging a road superintendent is that we judge him by the mileage he reports to his county council. Just as long as the county council run the road business you will have that same attitude. They do not ask what kind of road he builds but how much mileage he builds for the money. They apportion so much money a mile for the road, and the engineer has just so much money to build the road with. No engineer knows what he is going to be up against when he starts to build a road, and very often his money runs out and he has to leave an uncompleted road or scamp the road in order to complete it with the money he has on hand. We pool the money in our county; it may cost $1,500 a mile in one place and $3,000 a mile in another part of the county. If you tie the road commissioner down to so much money, he has to build his road according to the money he has.

This matter of road-building must be looked at as a business proposition. There is no other business in the world that is run like our road business; it is not considered as a business proposition at all in many places. An important thing in build-

ing roads is to have a good system of checking on the cost of the road; but in the beginning of our road-building, we did not have to give as much information to the Department as we do at the present time. The foreman on the roads should report to the superintendent his costs for every day in the week. No man can put the same amount of gravel on a road to-day that he put on yesterday, because conditions may change. When you are building a 10 inch road you will find some places where you have to put 15 or 18 inches of metal. The road superintendent should be in a position to show the people, not how many miles he has built, but that he has given them 75 cents value for every dollar he has spent. No corporation gets 100 per cent. value. You will find that the great question in road-building is the business end of it, keeping check upon your costs so that the superintendent will know every day in the week how much it is costing him for the road.

We have only about seven bridges in our county, the largest bridge we have built in the last ten or twelve years being a 12 ft. bridge; we haven't built anything this year over 9 ft. We haven't any running water in our county in the summer time. The question of carrying our surface water off is simply a question of cement tile. It has been a serious question with us during the last few years to get our tile laid economically. In order to do that, we have instituted a series of reports and cross-checks, and we know every day in the week what the men are doing for the money.

A Delegate: Do you own quarries, and do you crush your own stone?

Mr. Cleminson: Yes, we have limestone. We cannot get it out of the hillside and we have to go into the flats. We pay $100 an acre for it. It costs from 60 to 90 cents a yard to crush the stone and haul it and put it on the road. If we can locate the quarry in the centre of a three-mile stretch of road, we find that it is the most economical. The length of the haul is one of the main points in the cost of a road. In some cases we have had to haul two and three-quarters miles and that made the expense greater, and the road costs $3,000 a mile. We have been able to build the same class of road for $1,900 a mile when there was a short haul.

"THE EVOLUTION OF THE ASPHALT PAVEMENT IN TORONTO."

George Powell, Esq., Deputy Engineer, City of Toronto.

Mr. Chairman and Gentlemen:

At gatherings of this kind it is apparently the proper thing to discuss some form of highway or pavement construction, and, in order not to be different from those who have preceded me, I have chosen to-day to describe the changes that have been made in the construction of the asphalt pavement since it was first laid in Toronto.

In the year 1888, the first asphalt pavement was laid in Toronto, on Bay Street, between King and Front Streets. The construction of this pavement created a great deal of interest, as it marked the inception of an entirely new class of pavement in Toronto. Almost any time during the day crowds could be seen on the sidewalks, showing a very deep interest in what was going on, especially so when the surface gang, composed mostly of negroes, started to work. The men employed on the surface work were practically all imported from the States, and

it was quite a long time before there were enough local men sufficiently well broken in to the work to make it unnecessary to retain the negro experts longer. At the present time there are, perhaps, two or three coloured men still engaged in the work of laying asphalt pavements. To-day the construction of any pavement, be it asphalt or otherwise, creates only a passing interest, to such an extent have the people become accustomed to modern methods of constructing Good Roads.

The specifications governing the construction of this first pavement were somewhat meagre, and apparently the five-year guarantee demanded was thought to be sufficient protection. The foundation was composed of six inches of hydraulic cement concrete of the following proportions: 1 part of hydraulic cement, 2 parts sand, and sufficient crushed stone or brick to give a surplus of water when rammed. A rather indefinite specification, you will admit. However, the work must have been good, for a large portion of the original concrete is still on the street and does not show any signs of failure. The surface consisted of a cushion coat one-half inch in thickness, and a surface of two inches, or a total depth of wearing surface of two and one-half inches. The usual methods of rolling and finishing were used. The cushion coat was of poorer mixture than the surface, and served no useful purpose except that it would have probably proved difficult to rake to an even surface a mixture having so great a thickness as two and one-half inches.

This type of pavement was used on all streets, whether of light or heavy traffic, until 1892, with this exception: that in 1889 the proportions for the concrete were changed and Portland cement was specified. The proportions were as follows: 1 part Portland cement, 5 parts sand, and enough broken stone (no bricks this time) to give a surplus of water when rammed. In 1892 the popularity of the asphalt pavement became very apparent, but the cost, which was upwards of $4.00 per yard, was prohibitive, so a new pavement for light traffic streets was designed, which reduced the cost to about $2.50 per square yard. This light asphalt pavement consisted of a four-inch concrete base, with a two-inch asphalt surface. No cushion was used in the construction of this pavement. In 1895 the possibilities of the light asphalt pavement became very apparent, for in that year the light pavement was used on all residential streets. The specification became standardized, and the price had been reduced to about $2.00 per yard. The concrete was composed of: 1 cement, 3 sand and 6 of stone. The surface was two inches in thickness, with no cushion or binder. From 1895 to 1910 the light asphalt pavement was the standard for residential or light traffic streets; the only change occurring in 1901, when the proportions of stone, sand and cement in the concrete were changed to 1: 3: 7.

During this interval by far the greater part of the yardage of asphalt pavements laid in the city was of the light type, and this, generally speaking, has given the greatest satisfaction. The price of this pavement was at one time as low as $1.30 per square yard, caused by an epidemic of price-cutting, but a fair average during this time would probably be $1.75 per square yard. The guarantee varied from ten to five years. There are a large number of these pavements out of guarantee to-day that are giving good service, and the repairs required annually are not so serious as to render it necessary to resurface the streets.

The popularity of this type of pavement, however, led to difficulties, and in several instances this type of construction was used on streets that were of residential character at the time the pavement was laid, but, owing to the good pavement and the changing character of the district, a much heavier traffic reached the street than was anticipated, with the result that the pavements failed either

on the surface or foundation a few years after they were constructed. These mistakes in judgment, together with the advent of the high speed heavy motor truck, led us in 1910 to discontinue the construction of the light pavement altogether.

In 1908 a medium type of pavement was introduced to provide for those streets that were not entirely residential, and where it was considered heavy traffic might occur in the future. This was an effort to provide a cheap pavement for all classes of traffic, and at the same time to prevent a recurrence of the trouble referred to above in connection with the light pavement. This pavement consisted of a five inch concrete foundation of 1: 3: 7 mixture, one inch of binder and two inches of surface. In 1910 this type was substituted for the light pavement and became the standard for all streets but those in the downtown district or upon which there were street car lines.

Turning now to the heavy pavements, we find there was little or no change from 1888 to 1900, with the exceptions noted above in regard to changes in the proportions for concrete. In 1900 the cushion coat was abandoned, and a binder coat three-quarters of an inch in thickness was substituted, with a surface of one and three-quarter inches. The binder provided a better mechanical bond between the asphalt surface and the concrete foundation, and it was also supposed to prevent the absorption of moisture from the concrete which caused the pavement to deteriorate from below. In 1903 another change was made in the surface. The total depth of the surface was increased to three inches, made up of one inch of binder and two inches of top. From 1903 to 1913 the heavy pavement consisted of six inches of 1: 3: 7 concrete, one inch of binder and two inches of surface.

In 1914 the binder course was increased to one and one-half inches, the surface remaining at two inches, and what is termed a "close" binder was specified, instead of the open binder formerly used. The open binder was composed of three-quarter inch stone coated with asphalt, with little or no fines, while the close binder was made of graded stone with sufficient fines added to fill at least partially the voids. The close binder was adopted for two reasons: First, on account of the difficulty in getting the open binder to stay in place during the process of laying the surface; and, second, it was considered that a better surface could be produced by using a binder that was at least partially filled to start with.

Towards the close of 1914, the depth of concrete used on streets with track allowances was increased from six inches to eight inches, as it was thought that the heavy impact stresses caused by large motor trucks with steel tires was likely to cause failure of the narrow strips of pavements alongside the rails, as it is quite impossible, under present traffic conditions in Toronto, to get any reasonable distribution of traffic on the streets where car tracks are constructed.

The kind of gutter to be used with an asphalt pavement has always given us trouble and, up to the present time, four different materials have been used. In the early history of the pavement, the asphalt was laid right to the curb on streets that had a good fall, and stone gutters were used on streets that had flat grades. The asphalt gutters failed in nearly every case. The stone gutters were costly, because very uneven, and great difficulty was experienced in repairing them. Concrete gutters were next tried on all the streets, but they did not seem to stand the traffic. The width of concrete gutters was varied from time to time to see if that would have any effect, but without any benefit. Finally a brick gutter was adopted, and is now in use, and it is hoped that it will stand both the water and the traffic.

The question of guarantee has always been more or less closely associated with the construction of asphalt pavements and, as has been pointed out, the early

pavements were guaranteed for five years. This guarantee, in the early history of the pavement was, no doubt, a great inducement to engineers to give the pavement a trial, as it placed the responsibility for results upon the contractor and was no doubt a legitimate advertising device. However, as time went on, one would naturally expect that experience gained in the use of the material and the wearing qualities of the pavement would have caused the guarantee period to decrease, but it was not the case in this city, for in 1896—eight years afterward —the guarantee was increased to ten years. I do not know what caused this change, but I feel that it was a device of those interested in the construction of asphalt pavements to secure their greater use by giving a so-called greater protection. In 1908 the guarantee was reduced again to five years, and in this case the reasons were two-fold; first, to decrease the cost; and second, to relieve the contractor, to some extent at least, of the onus of the guarantee, as he has no voice in the framing of the specifications or in the design of the pavement. In 1913 the guarantee period was again changed to ten years, as council thought that the people would prefer to have such an insurance with their pavements, notwithstanding the fact that the cost would be increased by this insurance.

We now come to the question of the asphalt used in the construction of pavements during this period, and the records show that from 1888 to 1902 practically all pavements had been laid with Trinidad Pitch Lake Asphalt, but in that year a new asphalt was introduced, known as Acme California Asphalt, and from that time on, as new asphalts came upon the market, the specifications were opened up till to-day the Standard Specifications, as adopted by the leading Associations for Standardizing Paving Materials, are in use. We have streets laid in Toronto with practically all brands of asphalt, both natural and so-called oil asphalts and, if we eliminate some of our old pavements in the downtown district, I think we have secured almost as good results as in any other city in either the United States or Canada.

A good deal of work in Toronto is done on petition, and in the early days petitions were circulated by contractors, in which the kind of asphalt to be used in the pavement was specified. This practice did not cause any trouble at first but, as other companies were formed, this method of getting business caused endless trouble, owing to the desire of the various contractors to specify the particular brand of asphalt in which they were interested. It was a hard struggle to get rid of this nuisance, but finally, after learning the experience of other cities along similar lines, it was decided that the Department should issue all petitions and eliminate therefrom the vexed question of the brand of asphalt. In this way any asphalt that complied with the specifications might be used and, as pointed out above, our specifications were gradually opened up, until to-day practically any good asphalt, from whatever source, may be used.

One of the requisite features for the proper control of the construction of an asphalt pavement is a testing laboratory, and as a general rule those cities that do extensive pavement work of this kind have a more or less well equipped laboratory for the purpose of checking up materials of all kinds, either by chemical or physical tests. About 1897 or 1898, the City of Toronto made its first feeble efforts along this line. Cement was tested prior to this, but no check was made on asphalt or asphalt mixtures. Year after year additional facilities were added whereby the work being done by contractors could be checked, but it was not until 1907 that a special building was erected and proper facilities provided for doing the work adequately. At the present time, our laboratory is provided with

practically all the apparatus necessary for the proper investigation of the materials entering into the manufacture of an asphalt pavement.

The fact that asphalt pavements were guaranteed for such long periods had a bad effect upon the business, as it discouraged investigation of the materials and caused engineers to take things for granted and trust to guarantees rather than investigate for themselves the merits or demerits of the various paving materials. As a result it was a long time before engineers became sufficiently well educated to begin to formulate the specifications according to their own ideas rather than to those of the contractors. Methods of construction and tests have been standardized to such an extent that the air of mystery that formerly surrounded all forms of bituminous pavements has been absolutely dissipated, and the time will come, no doubt in the near future, when guarantees will not be required, except a nominal one perhaps, as an assurance of good workmanship.

There is one other interesting feature in connection with this subject that I desire to speak about, and that is the establishment of a municipal asphalt plant. In 1907 the city provided the Department of Works with enough money to erect a 1,500 yard plant, and the machinery was installed and the plant running before the end of the year. The Department laid three small pavements before winter set in, and each year since that time we have laid a large yardage of new pavement by day labour, in addition to keeping all streets out of guarantee in repair.

You are all probably aware that the city puts in a bid on nearly all work in competition with the contractors, but previous to 1907 we were unable to do asphalt work even if our tender was the lowest, but the provision of the plant enabled us to become a factor in the asphalt paving business since 1907. Our custom, however, is to permit the contractors to take the work awarded to the Department, if they are prepared to do it at our figure. Enough work is kept to keep our forces busy during the year.

Before leaving this question I desire to describe briefly another use of the asphalt pavement that has developed during the past few years, viz., the resurfacing of brick pavements. In several instances people living on streets of residential character have petitioned for an asphalt surface in order to decrease the noise that became more intense as the brick pavement grew older. The type of pavement constructed was the usual form of asphalt pavement, composed of one inch of binder and two inches of surface, with enough additional binder to bring the unevenness of the brick pavement to a smooth surface. The gutters, in some cases, demanded special treatment, in order that the existing catch basins might be used and a proper face maintained on the curb, but this difficulty was surmounted by removing the bricks and replacing them with sufficient concrete to permit the surface to be laid. The original crown was somewhat distorted, but not enough to cause any difficulty.

This method of treating these pavements has been uniformly successful, up to the present, as no failures have resulted after about four years of service. In only one case was it necessary to resurface a brick pavement, that had been practically worn out after a service of over ten years under very heavy traffic. The Department did not recommend this resurfacing as it was thought that the traffic was too severe to hope for success from this method of treating it, but the people made representations to the council that, owing to the changing character of the street, a cheap pavement that would last about five years was desirable, as it was thought that in that time the street would have assumed a settled character; so the resurfacing was recommended and laid. We are watching developments with a great

deal of interest, and, if this pavement stands up for five years under the heavy traffic of this street, we need not fear for the success of similar ventures in the future.

I am afraid this paper may prove uninteresting to those not engaged in the construction of city pavements, but I think it shows clearly the effect that practice in other places has had on the work done in this city. We have endeavoured to keep abreast of the development taking place in other cities, and our specifications are continually being changed in order to give what we think will be the best results for the people's money. There should be a hearty co-operation between all roadway and highway engineers, so that the dissemination of useful knowledge, in connection with the improvements taking place from time to time in the methods and materials used in the construction of Good Roads, may be general.

SEVENTH SESSION.

Thursday Afternoon, March 25th, 1915.

J. A. Sanderson, Esq., in the Chair.

"GOOD ROADS AND THE CONTRACTOR."

Herbert T. Routly, Esq., O.L.S., Huntingdon, P.Q.

Mr. President and Gentlemen:

When requested by the President to prepare a paper on the question of Good Roads from the standpoint of the contractor, I felt much hesitation, as my limited experience would hardly justify me in undertaking so important a task. It was arranged however, that unless this phase of the Good Roads question was covered by some of the more experienced men, I would make the attempt. Throughout this paper reference is more particularly to macadam roads under township or county control, the cost of which however may be partly borne by the Province.

In discussing any subject it is well if possible first to clearly define it, so that all will know exactly what is under discussion, and the various remarks will therefore be more to the point. Next to building a good road the greatest difficulty is perhaps to define one. Every other man will have a different definition, the terms of which will depend more upon the type of man and his personal experience and associations than upon the type of road; and as there are multitudinous types of men, so there is an unlimited variety of descriptions for both "Good Roads" and "The Contractor." But among the countless varieties or types of men who do so consciously or unconsciously attempt these definitions, there is one particular class whose opinion or definition is especially valuable. The experience and training, the powers of observation and deduction, the honesty and integrity, the intimate and unprejudiced association with both subjects particularly, all fit this class of man to voice an opinion or frame a definition. Our highway engineers compose this class. Though no definitions would satisfy a large proportion of the general public, the following are submitted in the hope that they will at least be found sufficiently accurate and comprehensive as to serve for a basis of further discussion.

A Good Road—A comparative term incapable of exact definition. Generally speaking, however, "a road with a general alignment of tangents joined by regular easy curves, with a profile consisting of a series of minimum to moderate grades, with adequate surface and sub-drainage, with sufficient foundation composed of consolidated non-perishable materials, with shapely well-bonded and lasting surface, hard, smooth, but non-slippery," would be considered a Good Road. You will note the absence of any reference to cost or location. If you were to find such a highway in the jungles of Africa built at fabulous cost but absolutely devoid of traffic or apparent purpose, you would still be justified in exclaiming that it was a "Good Road." Plainly the term "Good Road" is inadequate to describe what we are striving for. The vital and the most essential qualifications are those which will appeal to the competent engineer as to no other, and would more properly be defined as follows:

The Best Road—"That road which in its location, dimensions, material, mode of construction, and cost, is the most suitable and the most economical of all

possible roads for the accommodation of the present and probable future traffic it will have to carry." Should we not alter our printed announcements, our very name, and in many cases our very motives, and hereafter speak and strive for Best Roads rather than simply Good Roads?

THE CONTRACTOR—"One whose practical experience, plant equipment, staff of employees, and executive abilities especially qualify him for undertaking a certain line of construction work, and who engages for a stipulated price to perform a certain definite quantity and quality of work thereon."

Best Roads or even Good Roads, in the modern sense, are still practically unknown in Canada outside large cities and with a few particular exceptions. We are at the beginning of what, during the next two or three decades, will be the outstanding features of our municipal constructional work. We have exceptionally variable and difficult climatic and soil conditions with which to contend; we have a traffic whose rapid changes in type and volume make the problem of economic design most puzzling; and we have a people whose transportation education has been somewhat one-sided.

It is a source of constant wonderment why our people give so lavishly in support of steam railways, so conservatively to rural electric lines, and so grudgingly, sparingly and hesitatingly to the improvement of our country roads. Many taxpayers rarely use the steam railroad for direct personal pleasure or convenience. In any case it has a very unaccommodating schedule of time and stops, compelling us to regulate our whole day's programme in order to keep its appointment, but giving no guarantee of being on time itself. We may have to drive five miles over abominable roads to a station, only to have the train take us back past our very door on the way to our destination. Though our money has secured its construction, yet, when we ride or make freight shipments on it, we are compelled to pay in cash usually much more than the actual cost of the service rendered. We must expect to provide our share of cost of operation, maintenance and dividends on that portion of the capital cost which we have not ourselves provided; but why should we also contribute an extra tax to provide for dividends on a large amount of watered stock as well? The electric rural lines treat us better, being a much closer approach to individual accommodation, for the service is more frequent and the stops more convenient. But when we consider the conveniences of location, the variety of accommodation, the blissful absence of fares, time schedules and other restrictions, and the almost perfect freedom and mobility to all persons at all times and for all transportation purposes of a general system of modernized country roads, it is almost incomprehensible why we have so long denied ourselves this great modern utility.

It has been said, in effect, that the state of a country's transportation system is an index of the stage of its civilization. If this be so, we in Canada have attained a sort of super-civilization, being very highly developed at the top or steam railroad portion and sadly behind in the department represented by our common country roads. Military men would liken our position to that of an army whose heavy artillery has been pushed away ahead of supporting infantry, instead of following behind and taking up new positions only after the surrounding country has been cleared of the enemy and occupied in force by friends. Our strategic position is bad economically, and it behoves us to halt our railway expansion until we develop its main supporting arm, the country road.

It is not here intended to question the necessity or propriety of our railway appropriations, but to criticise their relative disproportion to those for the other branch

of our transportation system, our country roads. Why is it that we deny ourselves the pleasure and benefits of a modern system of rural highways, though still giving magnificently to railroad extension? Is it not due to the freedom and public ownership of the one, and the charter monopoly and private control of the other—to the difference in the status of the organizer, promotor and contractor with regard to the two schemes. In the one case all the work of preliminary examination, of organization, and of public education (such as the present convention) is voluntary, public-spirited and disinterested labour, for which no man has any surety of reward, either financial or in the appreciation of the public whom he seeks to benefit. In the other case we legislate to certain individuals a monopoly of certain transportation privileges granting the rights of regulation, of restriction and of operation for profit, and these favoured individuals then have every inducement and protection in organizing support and securing the appropriation of public funds to assist their enterprise.

Our public ownership of country roads has been largely a failure through neglect and lack of proper organization. What is everybody's business is usually nobody's business, and so we have advanced but slowly and in many localities not at all. Fortunately the times are changing and we are now feeling the effects of the last ten years or more of organization and education, and we look to see tremendous developments during the next few years. Otherwise I would suggest that we revert partially to private control and assist with Government guarantees, subsidies or other means, granting a limited franchise and favourable terms for the construction at least of the leading trunk roads. Under present improving conditions, the proposition is inadvisable, but if some such scheme were adopted, we would soon have hundreds of miles of the finest roads in the world, because our monopolized friends would see to it that we contributed on a scale far in excess of the present expectations of our most advanced Good Roads enthusiasts. That energetic and capable individual, "The Contractor," would then come into his own for, in that event, straight competition, economy, efficiency and speed would control the selection of methods, and the system of his rival "Day Labour" will seldom stand long against him under those conditions.

But returning to the present, let us consider these two principal methods by which our road construction is now undertaken, viz.: Day Labour and the Contract System. Each has its strong advocates, who proclaim its virtues and decry the deficiencies of its rival. Observation, however, has shown that the most important consideration in instituting a road improvement campaign is not the choice of system but the choice of man—the engineer or superintendent who is to be placed in charge. The right man will make a success under either system, the wrong man under no system. The proper man having been selected, his advice should influence the choice of system to the same extent as it does the choice of rival locations for a particular piece of road or rival types of bridge construction. Conditions vary, in some cases the Contract System is impracticable, in others Day Labour highly inadvisable.

Generally, however, where the proposed system is of sufficient magnitude and continuity to attract competent contractors, the Contract System is almost invariably better. If a superintendent or engineer can handle such a proposition successfully by Day Labour, he will have no serious added difficulty in changing to the Contract System. He will have much more time to devote to the strictly engineering duties of location, design and supervision—duties which are the same under both systems, but are so often interfered with by the extra pressure of execu-

tive details under the Day Labour System. And if an engineer or superintendent fails to make good under ordinary conditions with the Contract System, nothing but Providence can save him and the municipality from disaster if he attempts the Day Labour System. Among others it will add the duties of (1) securing, transporting, housing and feeding teams and workmen, (2) selecting and instructing foremen, timekeepers and other staff, (3) choice, purchase, care and setting of machinery, (4) daily planning of work and distribution of forces, with all the complications and derangements due to illness of men, breakdowns of plants, delays of shipment and changes of weather. No one who has not worked under both systems can realize the difference or appreciate the possible results in altered efficiency and economy of a change from one system to the other.

A very general and justifiable objection to the Day Labour System is the fact that political or personal influence has too much weight in the appointment and retention of all employees from the superintendent to the water-boy. We will not attempt a lengthy discussion of this objection, which perhaps is the one most often and most thoroughly expounded. There are engineers and superintendents who take violent offence—and rightly so—at any imputation of improper influence having had anything to do with their personal appointment or, thereafter, with the appointment of those under them. They demand and receive absolute control of all employees and run the work on an efficiency basis. We have no quarrel with them, and usually no criticism of their work either. Such men in such positions are a credit and an honour to the community in which they serve and a source of strength and inspiration to all other engineers and superintendents. But the instances of municipalities run on such a perfect Day Labour System are rare; and the Day Labour System has now reached its maximum efficiency and been metamorphosed into a species of Contract System—a modified "cost plus a fixed sum," or "cost plus a percentage" form of contract, with the municipality furnishing the plant and capital. Your superintendent has become a contractor through working under somewhat unusual financial arrangements. There are reasons, however, why the regular Contract System is to be preferred, especially in its distribution of duties into those of design and supervision on the one hand and of execution on the other.

Many municipalities unconsciously deceive themselves when attempting a comparison of the two systems. The prices tendered by contractors seem outrageously higher than the prices they believe themselves to have attained by Day Labour. The difference is more apparent than real. How many such municipalities count as a part of the cost of any piece of work the following charges, every one of which the contractor *must* count and every one of which the municipality *should* count; for they are truly and inescapably a part of the cost of every portion of road built under either system:—

1. *Bonds*: Generally bid bond, construction bond and maintenance bond. Company bonds are now preferred by nearly all municipalities and should be insisted upon in preference to private bonds.

(*a*) Bid Bond—Guarantees that if the tender of the contractor is accepted, the said contractor will proceed to the signing of the final contract and the bonding company will become his surety for its due fulfilment.

(*b*) Construction Bond—Guarantees that the work for which the contract is drawn will be carried to completion within the time limit and for the contract

price—regardless of what the actual cost may be to the contractor; the effects of war, acts of Providence, and similar causes alone granting relief.

(*c*) Maintenance Bond—Further guarantees to the municipality that, free of charge to it, the contractor will maintain the work in good condition for a specified term of years.

If the Day Labour superintendents, commissions and councils had to back their estimates of Day Labour costs with cash bonds guaranteeing to the ratepayers the same results as they demand of the contractor, would there be a revision of their estimates?

2. *Public Damage and Employers' Liability Insurance*: The risks are there just as certainly for the municipality as for the contractor, and they have a considerable cash value. The contractor *must* count them and the municipality *should,* as it absolutely cannot escape the liability, though it often does the penalty.

3. *Machinery and Plant Charges*: When a municipality undertakes day work road construction it has two alternatives with regard to machinery. It may rent or it may purchase. Invariably a purchase is made and this is often a costly error, for the ordinary township council is not an expert judge of the relative value or suitability of various makes of road machinery. But plant rentals look too ominously large and would figure indisputably as part of the cost of the various pieces of work. So purchase is resorted to, the cost paid from a general fund and rarely apportioned to the various sections of roads on which the plant is subsequently used. Can any body of intelligent men giving the matter fair consideration escape adding to the cost of every mile of road an item to cover machinery charges? There are (1) interest on purchase price, (2) allowance for depreciation or sinking fund, (3) upkeep, (4) boiler and fire insurance, (5) winter storage and transportation from one job to another. These charges are nearly all operative during the whole year, *whether the machinery is working or idle.*

4. *Capital Charges During Construction*: The contractor has usually to wait from one to three months for his pay. His interest charges are considerable. The municipality may borrow funds during construction under either system. Under the Day Labour System they borrow and pay promptly. Under the Contract System they very often delay and the contractor has to bear the interest charges throughout the season on once, twice or three or more times his total monthly pay roll and expense accounts.

5. *Uncertainty of Continuous Work*: An item seldom considered by either the municipality or the contractor is the uncertainty of finding continuous work for the plant. And yet we have but to travel around to see thousands of dollars' worth of idle plants. Little of that actually in use has the guarantee of continuous work during the remainder of its ordinary period of usefulness. Who stands the loss if the money supply fails and the work is suspended for a year or so? Three road engines were purchased for a definite contract near Toronto. The money supply failed before the contract was half finished, and after several months of idleness the plant was moved over three hundred miles to a new contract in the Province of Quebec. To which contract should the lost time and expenses of moving be charged? Were the municipality working by Day Labour, it could do

little except store its plant until times got better, meanwhile carrying the interest, depreciation and other charges. Should not this risk be considered in estimating the cost of Day Labour work and in explaining some of the variation between the figures furnished by a Day Labour superintendent and a prospective contractor?

6. *Specifications and their Fulfilment*: Here you may have the greatest of all discrepancies. Municipalities expect—and rightly so—a thorough and proper fulfilment of the specification by the contractor. One of the principal arguments advanced in favour of the Day Labour System is the greater ease with which the specifications can be altered to suit circumstances. Granted. But if the specifications were prepared by a competent engineer after a thorough examination, there should be few instances where changes are necessary, and these will be found to have been properly provided for, whether the work is to be done by Day Labour or by Contract. This discrimination in the power of changing the specifications under only one of two competitive systems is unfair and is often dangerous, for such changes are almost invariably to the detriment of the work in the saving of cost. The specifications are designed to give a road of a certain standard, and the Contractor must overcome all difficulties and attain this standard or expect trouble. It is wonderful, the difference in the sacredness and inviolability of the specifications as viewed by a Day Labour council and superintendent and as viewed by the same men when a change has been made to the Contract System. How different is the care taken to secure accurate measurements of the quantity of material moved, the thickness of consolidated metal, or the bottom grade of a side ditch.

The foregoing are a few of the points in which a municipality may deceive itself in estimating the cost of its work for comparison with the prices tendered by contractor. Let us attempt a comparison, assuming as a basis the minimum plant equipment required for a rural road contract using local field stone, and assume that six miles of twelve foot macadam road constitute a season's work. Prices will vary with the locality and the condition of the labour market. Suppose we assume that a municipality is building its road for $4,000 per mile, direct outlay, about what price would they be justified in paying to a contractor? Or rather, let us endeavour to estimate the *actual* cost to the municipality of the road upon which its direct current expenditure is $4,000 per mile. Referring to our former points, we get the following approximate estimates:

1. *Bonds*—Usually figured as a percentage on the amount of the contract and running about 3 per cent. Using the $4,000 cost as contract price, we would have a bond costing $12.00 per mile.

2. *Public Damage and Employers' Liability Insurance*—The first would cost about $12.00 per mile. For the second the rate averages above $1.50 per $100.00 pay roll. The latter comprises at least 80 per cent. of the monthly expenditure, giving a charge of $48.00 per mile.

3. *Machinery Costs*—The following tabulation will give a fair idea of how this item should affect the prices:—

Article.	Cost.	Annual Interest at 6%	Interest charge per mile.	Years of life.	Annual Depreciation.	Mileage Charge for Depreciation	Annual Up-keep.	Mileage charge for Up-keep.
	$ c.	$ c.	$ c.		$ c.	$ c.	$ c.	$ c.
10-ton Roller.....	2,800 00	168 00	28 00	12	233 33	38 39	60 00	10 00
Crusher	1,400 00	84 00	14 00	8	175 00	29 16	360 00	60 00
Bin and Screen	750 00	45 00	7 50	8	93 75	15 62	120 00	20 00
Crusher Engine	1,000 00	60 00	10 00	12	83 33	13 90	60 00	10 00
Grader and Sprinkler	600 00	36 00	6 00	10	60 00	10 00	30 00	5 00
Small Tools	500 00	30 00	5 00	2	250 00	41 67	250 00	41 67
	7,050 00	423 00	70 50	.....	895 41	149 24	880 00	146 67

Fire insurance, boiler insurance, boiler inspection and winter storage would run above $180.00 or a charge of $30.00 per mile. The cost of moving from one job to another we will omit, considering it a part of the direct cost, as are also fuel, oil and other operating charges.

4. *Capital Charges for Current Expenses.*—Assuming that the delay amounts to only one month, it means that the interest on $4,000 for one month is a charge against each mile of the road. At 6% this gives $20.00 as a minimum; but contractors have frequently to carry a whole season's operations, and an average of two months' expenses or $40.00 per mile may be considered very conservative.

5. *Uncertainty of Continuous Work.*—It is rather difficult to fix a cash equivalent for this item; our data is incomplete. The item, however, is most important and should never be disregarded, as its oversight has spelled disaster for many a firm. Most contractors for road work in this country spend about 20% of their time estimating, tendering, or otherwise securing work for their plants. It represents a charge of anywhere above $200.00 per mile, and a similar risk and item of cost applies to every municipality purchasing a plant.

6. *Specifications and their Fulfilment.*—We now approach an exceedingly delicate phase of this discussion when we attempt to estimate the relative value of the average mile of Day Labour road and of Contract-built road. I feel like a new recruit who has blundered out past the firing line into "No Man's Land," where the bullets come from both directions, from friend and foe alike. How much better work will be done by Contract than by Day Labour, and how much more per mile will the final result really be worth to the municipality? It depends upon many variable conditions. There are cases, as has been intimated, where the Day Labour System is so well organized and managed year after year as to rival in thoroughness and economy the work of the best contractors. A change of superintendents may alter the situation entirely, so that any Contract System would be preferable. On the other hand, a great deal depends upon the type of contract, whether it stipulates itemized prices or a flat rate per mile. The latter basis is common in portions of the Province of Quebec, and when motoring through the country it is easy to distinguish those townships which are working by Contract from those where the Day Labour System is employed. One might expect the contractor to fall below the standard of Day Labour under such conditions of contract, but this is not found to be the case, the contract work showing at once

the superiority in finish and workmanship, though many of the contractors are new to this line of work, being mostly ex-railroad men. I hesitate to set the figure for this item, but a minimum average estimate would be not less than $500.00 per mile.

Summary.

Bonds	per mile			$12 00	
Public Damage	"	"		12 00	
Employers' Liability Insurance	"	"		48 00	
Machinery Allowance:					
Interest Charges	per mile		$70 50		
Depreciation	"	"	149 24		
Upkeep	"	"	146 67		
Insurance, etc.	"	"	30 00		
				396 41	
Capital Charges	"	"		40 00	
Uncertainty of Continuous Work	"	"		200 00	
Value of Contract Work in excess of Day Labour	"	"		500 00	
Total Extra Charges	"	"			$1,208 41
Municipality's Estimate of Cost	"	"			4,000 00
					$5,208 41

From the above summary we see that these items constitute an excess of 30 per cent. or more over the original estimate of $4,000. Had we assumed the current cost as $3,000 instead of $4,000 per mile, the percentage of increase would have been 40 in place of 30, as the actual amount of the above charges would have remained nearly the same. And, mark you, they are net figures, forming no part whatever of a contractor's profit. They are contractor's cost items, every one. He must still make his profits from what he can save in doing the actual amount of work done by the municipality for the original $4,000, and what he can secure in excess of the above total. And, as his chances of getting a price to give profits at this end are slim, he would do well to examine very carefully the possibilities of saving a large part of the original $4,000.

Many municipal councils have a bias against contracting, wholly due to a misconception of the type of men engaged therein and of the methods by which they endeavour to make their profits. It is a similar prejudice to that which usually manifests itself in isolated communities where the people are all of one religion and do not meet or mingle to any extent with those of other religious beliefs. In both cases the prejudice generally melts away when new conditions cause a free intermingling and closer personal relationship between the rival elements. We then find much to admire and little to fear in the members of the other denomination. So you will find that road contractors as a class are quite similar to men in any other line of business. They are guided by the same principals of economy, integrity and honour. But they are objects of more general discussion, unfair opposition and personal criticism because their work is public work and is at all stages wide open and exposed to the public gaze. Few can see the finished work through the apparent litter and disorder of construction. There are always soreheads and busybodies and it is easy to pick on a multitude of trivial incidents, each of which is misunderstood or wilfully distorted and magnified to the general discredit of the contractor.

Many municipalities, however, have changed from the Day Labour System, after finding it impossible to attain satisfactory and economical results thereby, or even to keep the actual current outlay within their estimates. The Province of Quebec is a fine instance of a rapid awakening in this regard. When instituting

the programme under the Good Roads Act of 1912, it was assumed that all the townships availing themselves of Government assistance would work under the Day Labour System only. All blank forms for by-laws, inspectors' and engineers' reports, etc., were printed for this system. A great many of the municipalities thus commenced the work, but with few exceptions they have changed to the Contract System, and most townships now undertaking the work for the first time profit by the experience of their neighbours and contract their work from the beginning. An entirely new lot of blank forms had to be prepared suitable to contract work.

A few suggestions for the consideration of municipal bodies may here be permitted. They will be mostly "dont's," but the first is a positive and emphatic "do." When you first decide to adopt some system of modern road improvement for your municipality, consult a competent road engineer. Don't wait until you have decided upon the particular roads or the type of construction; and don't hamper your engineer by a false economy during the preliminary examination. He should make a general study of the present and prospective traffic requirements, available supplies of suitable local materials, supply and cost of local labour, and cost of outside materials likely to be required. Then, with the additional knowledge of soil and drainage conditions, your engineer will be prepared to *advise* as to the relative cost and economy of various types of road, the *decision or choice* of course remaining with the council. He must then thoroughly examine in detail the various roads to be improved, so as to revise any false locations, establish grades, design culverts, bridges or other structures and finally prepare proper plans, specifications and estimates of cost.

In calling for tenders, all available data with regard to labour and supplies of material should be summarized and furnished intending bidders. All contractors then clearly understand conditions and are on an equal footing, and there should be little excuse for misunderstanding or litigation after the contract is let.

It were better for a municipality to engage a competent engineer for the preliminary studies, the design, specifications, and choice of a contractor and then dispense with his services, than the more customary reverse method by which an engineer is employed only after the contract has been awarded. In the one case you are off with a right start on a definite programme—proper plans, and clear and intelligent specifications. In the other the engineer finds a specification entirely inadequate, ambiguous or clearly unsuitable to the work in hand, and he is indeed fortunate if he and the contractor are able to read the same meaning from the different clauses. In any case it is usually then too late to make advisable changes in location, method, material or type of construction. Secure your engineer early, and make every endeavour to have the best man available. You will probably have in your midst a surveyor or engineer of the right type and character, though inexperienced in the special department of roadmaking. Engage him, but see that he has the benefit of consultation with an expert before any final decisions are made or contracts let. You may think all this unnecessary expense, but you will find it is the truest economy. The old saying, "A stitch in time saves nine," is very applicable. You who are about to engage upon a new programme may not see the full force of these suggestions. Experienced road men—be they engineers, superintendents, contractors, municipal councillors, township clerks or Government officials—will, however, heartily agree with and endorse them. Take your cue from those who have already been through the mill.

Those who adopt the above suggestion will scarcely require the following warning; those who do not, are more open to temptation. Herein lies the germ

of a great deal of the trouble which develops between municipalities and their contractors. *Don't call for tenders simply for information. Don't call for tenders unless you really mean business.* A contractor's time is valuable, and he resents being dragged half across a Province, spending days away from his work preparing an estimate and bid, only to have the same tabled with little or no action other than the exposure of his prices. This is sharp practice, the procuring of expert advice for which you should have paid an engineer. It will be resented by all honest contractors and many will refuse to bid a second time, when you do mean business. Usually in such cases the specifications are very crude, and a resentful or crooked contractor may come back, take the work at what seems a very low figure and then, taking advantage of faulty specifications in a strictly legal way, squeeze out a satisfaction sufficient to have employed half a dozen engineers in the first place.

Or perhaps you call for tenders and find your local or favorite contractor, in whom you have confidence and to whom you wish to let your work, underbid by an outsider. Be men with the courage of your convictions and allot the work just the same. To call again, trusting your choice to underbid the other, is inviting all kinds of trouble. If your local man's bid was too high, he was trying to take advantage of you and should be treated accordingly. A local contractor already has a big enough advantage over an outsider in his local following and personal knowledge of conditions. If the other man was unreasonably low, he probably did not examine the work properly, is inexperienced or incompetent, and had better be left out of consideration unless he can bring satisfactory proof to the contrary. On the other hand, if the two bids are reasonably close but the favoured contractor a shade higher, there is no reason why the contract should not be awarded to him, if the municipal officers feel that it is worth the difference to have the one man rather than the other. A contractor who has established a local reputation for fair and honest dealings and for the excellence of his work is entitled to some favourable consideration, and it shows good courage and judgment on the part of a council when such an award is given, and becomes an added incentive to all worthy contractors to feel that superior workmanship is so appreciated. But to table a set of bids and advertise again, simply to give the local man a chance to get down low enough to secure the contract, is a very bad practice and puts a premium on dishonesty. The practices of calling for bids for information only, or of exposing tender prices and calling again for no proper reason, are all too common and much to be deplored. Good contractors should refuse to bid a second, third and fourth time on the same work. A test case for damages for loss of time and expert services placed against some municipality indulging in this practice would have a salutary effect and a fair chance of success. These and similar cases of deliberately or thoughtlessly bad practice are seldom chargeable against a municipality which has employed a competent engineer.

A word to my fellow-contractors. It has been said that "Honesty is the best policy," and I believe contractors possess and practice this virtue as consistently as any other class of business or professional men. As a class, we are vitally interested in the expansion and development of the Good Roads movement. For this the confidence and support of the public must be gained and retained continuously. Anything therefore that causes marked dissatisfaction or irritation will have a distinctly retarding effect. Bid carefully and fairly. Avoid litigation over technicalities or other legal complications. Count all your items of cost and

insist on a fair price for your work. Then leave behind you a standing monument to your credit and an object lesson to the municipality.

The municipal officials and the contractor will find it to their mutual benefit and satisfaction, to the efficient and speedy prosecution of the work and to the approval of the general public, if the work is conducted throughout in a spirit of friendly co-operation and helpfulness. Remember always that your written contract is a Partnership Agreement, not a Declaration of War.

"TOWN PLANNING AND ROADS."

THOMAS ADAMS, ESQ., TOWN PLANNING ADVISOR, COMMISSION OF CONSERVATION, OTTAWA.

Mr. Chairman and Gentlemen:

The importance of planning the roads and streets of our cities and towns has not been sufficiently appreciated in the past, and it is doubtful if it is regarded even now with that seriousness which it deserves. We are all agreed that, on principle, a city or town should be planned in advance, and that in the planning of a city or town it is important that its means of communication by road should have some relation to the means of communication of the surrounding rural areas. That means that we recognize the desirability of preparing a skeleton plan of roads for each province, on which the plan of each town and village can be based. The difficulty has not been in approving the principle but in giving it practical effect. For one thing, those who have to administer the affairs of our municipalities, especially in this new country, are so much absorbed in the activities of the moment that it is difficult for them to give time to the work of preparing for the future. Hence, each generation goes on leaving to each successive generation the same problems and evils which they have had to deal with themselves, notwithstanding that they have learned the lesson of how to prevent the recurrence of these evils. Yet, when we come to analyze it, nothing could be more absurd than our present haphazard and wasteful method, or rather want of method, of constructing roads and streets without regard to any general plan, without proper machinery to enable us to regulate width, direction and alignment according to scientific principles, and with insufficient regard to the designing of each unit in our road system.

The road system of a community is like the arterial system of the human body. The former provides for the means of circulation of towns and districts, and connects up and provides access between the different parts. If not properly designed in advance, it leads to congestion. Regard should be paid to the need for main arteries, secondary arteries and the small branch arteries. Most of the large questions connected with municipal engineering have to be considered from this point of view. We design our sewerage system and our water supply system on a principle of having large mains, branch mains, and short connecting branches. What would we think of a system of sewering a town which had to conform to a regulation that all sewers had to be of one diameter? Yet it is on that absurd principle that we determine the width of our streets and roads to-day. For instance, Ontario has a by-law which prescribes that all roads shall be sixty-six feet in width, whether they be main arteries or short streets leading to a few

private residences. It may be taken for granted that from two-thirds to three-fourths of our streets and roads in cities and towns are required for the purpose of local traffic only. If the sixty-six foot width is determined according to the needs of a main arterial road, then it follows that seventy-five per cent. of our roads are much too wide, and that in the absence of a plan we are causing the people of this country to bear the burden of unnecessary expense in making and maintaining streets.

As a matter of fact, what happens in practice is that our by-laws fix a width not according to scientific theory nor yet on any practical basis, but simply because of the convenience of making a hard and fast rule in accordance with some custom. The sixty-six feet, which is the by-law width of Ontario, seems to have no other justification than the fact that it is the length of a chain. It is less by at least a third of the width that should be provided for main arteries, and it is more than twice the width of what is necessary for short domestic streets. It is true that, in the absence of proper planning schemes, you must have a system of regulation fixing a general standard in these matters—that is the inevitable weakness of the by-law system—but my point is that it is fully as absurd to regulate the width of a street according to a fixed by-law standard as it would be to prescribe that all sewers and water mains should be of the same capacity.

In Great Britain this point has been recognized for some years, but there difficulties are not so great as here. The standard width of streets in England is from 36 to 45 feet, with exceptions in some of the larger cities where the width has to be 50 feet, and the result is that the public have to bear a somewhat heavy share of the cost of widening main arteries, although a great many old highways exist which are much wider than required by the by-laws, and form a sort of trunk system throughout the country. The narrower width of roads in Britain as compared with Canada is partly responsible for securing a higher standard of road construction, and partly for enabling the middle and working classes to secure cheaper housing accommodation. In regard to the former matter, we are apt to flatter ourselves in Canada that, although our roads are not so good as the British roads, that is because this is a new country. We forget that the high standard applies to all new roads in Britain and not only to old highways, and that it is the new streets and roads which are being made to-day, rather than the old highways, which set the standard of modern efficiency in street-making. When we remember this, it is certainly a proper question to ask why suburban roads in Canada should not be as good as suburban roads in Britain. A good deal of time must pass, of course, before our rural highways can come up to the standard of those in the older countries, but that does not provide any excuse for the poor roads in many of our towns and the newly developed suburbs. One reason for the difference is due to a matter which I shall only refer to incidentally. In Britain, the burden of making new streets is placed on the shoulders of those who directly benefit from the subdivision of land for building purposes, and the roads have to be constructed according to the municipal standard before the land is fully used. In some cases buildings cannot be erected until the road is properly made. That is a matter which has a relation to the planning of roads, but it is a subject for separate consideration.

With regard to the fact that housing accommodation is cheaper where streets other than main arteries are narrower, we have to remember that the cost of a site of a house consists of three things, (1) the actual site which it occupies, including curtilage, (2) the land given up for road access and (3) the cost of local improvements, consisting of pavement, sidewalk, sewer, water main, etc. In a country

like Canada the cost of the bare land ought not to be a serious matter and, where it is forced up by speculation, as it now is, it ought to be controlled by legislation. The portion of the above cost, however, which seems to require most careful consideration on the part of engineers and administrators is that which is spent on local improvements. It is difficult to get at the figures, but I imagine they would be astounding, if we could obtain them, as to what proportion of the total cost per building site was in improvements and in maintenance alone.

In an English town the cost of the street, including the sewer, works out in an average case at $75 to $100 for a small workman's dwelling, costing say $1,000 to construct. This would include concrete or stone slab sidewalks and a pavement with a finished surface of bituminous materials. The cost per lineal foot run for a first class street forty-five feet wide would be from $10 to $12.50. As the houses occupy only about fifteen feet frontage, the cost per house is thus 15 x $5=$75 to 15 x $6.25 = $93.75. It has been found in practice that, by limiting the number of houses that can be erected on each acre to twelve, and giving them a frontage of 25 feet on a street 26 feet wide, dispensing with rear alleys, instead of 36 houses to the acre with a frontage of 15 feet on a road 45 feet wide, you get nearly three times the area round each house at no greater cost per house for road construction. The 26 foot road, consisting of 18 feet of pavement and two 4 foot sidewalks, is regarded as adequate for purely domestic streets not required for through traffic, and the buildings have all to be set back 15 feet from the boundary of the street, thus securing a minimum distance of 56 feet between all buildings. This is for a purely working class district. Having regard to the importance of designing streets on which workmen's dwellings are erected so as to secure the utmost economy, it would be well for Canadian municipalities to consider whether narrower and better constructed domestic streets, and fewer streets with deeper building plots, accompanied by regulations limiting the density of buildings and the widths between the building lines, would not be better than the wildernesses of bare, dusty roads and the crowded subdivisions that are the result of our present policy. It may be open to question whether roads should in any circumstances be made as narrow as 26 feet, but as our by-law width in Ontario is 66 feet as against 45 feet in the instance I have given, the proportionate reduction in width would be to 38 feet to secure similar results.

Personally, I see no reason why such variations as the following should not be permitted, if the number of houses is restricted to the acre, if the narrower streets connect at both ends with thoroughfares, say 40 feet to 50 feet wide, and if the streets are so situated that they are not likely to be required for through traffic:

(1) Streets not exceeding 350 feet in length to be 24 feet wide with 16 feet carriage way;

(2) Streets not exceeding 700 feet in length to be 28 feet wide with 18 feet carriage way;

(3) Streets not exceeding 1,500 feet in length to be 32 feet wide with 21 feet carriage way.

It might be argued that, even if we make our domestic streets too wide, we usually ignore the question of construction altogether, and leave them to take care of themselves. I have been in more than one town in Canada where the streets have to be 60 feet wide, and where the only form of construction is the occasional levelling of the soil or the dumping down of cinders. The traffic for the most of the year on these streets follows one line and the pavement area might

for that purpose be 8 or 10 feet instead of say 32 feet wide. The cost of maintenance in a case of that kind is, however, probably not less than it would be if the roads were properly constructed at the outset, and the loss to the community, indirectly, is a serious matter. There is the mud and the damp of the spring and autumn, and the disease-bearing dust of the summer to contend with. There is the lack of convenience for manufacturers in teaming their raw and manufactured material, and to them it is in many cases a matter of serious loss. In more than one of these towns I believe it could be proved that, if the width of streets had been regulated according to their traffic requirements and not according to a hard and fast rule, it would have been possible to have saved enough of the money spent in laying temporary construction, maintenance and expensive sidewalks to have made quite good streets. Partly because of these very wide streets in residential areas, owners find it difficult to face the heavy cost of paving.

But residential streets are not only too wide, they are too frequent because of our crowded and shallow subdivisions and because of the absence of plan. I could give examples of portions of towns where twice the length of street is provided than is necessary, and I propose to append a diagram to this paper showing that with more open development, i.e. with less street area and more open land round the houses, the saving in cost of street alone could enable us to have nearly twice as much land attached to each average workingman's house without any extra capital cost. In other words, the saving in local improvements could be made to pay for the extra land required to double the depths of our subdivisions in a suburban working class area.

The land given up to residential streets and our haphazard system of allowing factories and residences to be mixed together in all parts of our towns without any discrimination makes it difficult, on the one hand, to get wide main thoroughfares where they are required, and, on the other hand, to secure a higher standard of road construction giving access to areas that should be reserved for manufacturing purposes. Heavy trucks and wagons which use the streets in industrial areas require heavy roads. But because we do not reserve special areas for manufacturing and other areas for residential purposes, we have either to make our roads too light for manufacturing purposes or too heavy and expensive for residential purposes. Thus in regard to width, length and construction of streets we have to keep up an extravagant standard because we allow our towns to grow up without a proper plan. It is because of this that the advantage of having wide roads where these are needed for through traffic is often questioned, the plea being that to provide for very wide roads casts too great a burden on the present generation for the benefit of posterity. That plea rests on the erroneous assumption that the intention is to make all roads wide and not to vary and regulate their width according to the use to which they have to be put. Under a proper scheme roads should not, as a whole, occupy a greater superficial area than they do now, but complementary to the narrow residential street fringed with deep front gardens would be the wide traffic thoroughfare.

In laying out main arteries it is cheaper as well as better to make our roads wide enough to meet future needs. This is particularly so where such roads are required for street railways. Every road which is intended to carry two streams of ordinary traffic and two lines of street railway besides should not be less than 100 feet and should, where practicable, be 120 feet wide. One illustration of the economy to be secured in this connection will suffice. I am compelled to take my illustration from British experience, as I understand this Conference wants facts,

and my acquaintance with Canadian conditions is not sufficient to enable me to cite cases in this country. But such facts as I do present refer to matters of principle which have direct bearing on our Canadian problem, even if conditions and costs differ. In Liverpool, Mr. John Brodie, M.Inst.C.E., the City Engineer, has demonstrated that he could widen an existing 40 ft. road to 120 feet at a slight extra cost compared to widening to 80 feet where such a road ran through open country and was required in part for a street railway. His alternative costs were worked out as follows for these widths:—

WIDENING TO 80 FEET

(Tramways paved.)

	£	s.	d.
Cost of land, 13¾ yards, at 5s.	3	6	8
Street works per yard lineal	7	2	6
Tramways (including paving) 1 yard at £6 15s. 0d.	6	15	0
	£17	4	2

= £30,286 per mile.

The above estimate includes for the reconstruction of the old road to suit new levels.

WIDENING TO 120 FEET.

(Tramways in grass.)

	£	s.	d.
Land for new road, 13¾ yards at 5s.	3	6	8
Street works per yard lineal	4	13	7
Tramways (in grass) including land, 1 yard at £6 16s. 8d.	6	16	8
	£14	16	11

= £26,128 per mile.

This estimate does not include for any alteration to the old 40 foot road.

This is a special case no doubt as, in making the 120 ft. road, it is possible to save the cost of reconstructing the existing road; but, even apart from that, the wider road would not seriously exceed the cost of the narrower road. The saving of £4,160 in the second case would be nearly sufficient to enable an extra 40 ft. of width of land to be purchased at a price of 3s. 6d. per yard. That price would be sufficient in view of the greater advantage to the owners of real estate in having the wider road. In any case, if such a road were made in a country district, obviously the 120 ft. road could be made cheaper than the 80 ft., as the cost of the land would be much less and the saving in construction would be the same. The saving in paving alone due to laying the tramways in grass is £3,000 ($15,000) per mile. Tramways running on grass are less noisy and do less injury to the land from a residential point of view. In fact, one of the advantages claimed for the wider road is that it causes, and has caused, builders to erect larger houses, thus keeping the richer inhabitants within the city boundaries. There is nothing more important in a town than to keep well-to-do ratepayers within its borders. It keeps down the taxes by keeping the assessable values high, and keeps a class in the city whose presence is most desirable from many points of view. There is no need for these wide roads to be immediately constructed of their full width. The essential thing is to earmark the land for them, that is, to plan them. The cost of construction can be spread over a long period but, if the land is not acquired, it may be used for building, which would prevent future widening except at prohibitive cost.

Nearly all the discussions that have taken place at this Conference indicate the necessity of planning our systems of roads and streets in a comprehensive manner. Wearing surfaces have to be adapted to local traffic as well as to traffic outside the city, to factory areas as well as residential areas. The complex question of the modern traffic problem requires consideration to be given to the width of main arteries, before buildings are erected upon the road frontages. In the financing of our roads, we have to recognize that everything that is spent on unnecessary width and construction on our secondary roads is so much capital withdrawn from use in improving our main arterial system.

As the Deputy Minister of Roads of Quebec has pointed out, roads are largely located to suit property lines rather than for suitable foundation and grades. This not only increases the cost and difficulty of construction, but it adds greatly to the cost of buildings. In many of our Canadian towns, people who want gardens cannot obtain them unless they have twice the width of a plot of land that is really necessary for the use of a house. Instead of having the land subdivided so as to give them space at the rear of buildings, they have to acquire land at the side, with the result that they probably have to pay twice as much for local improvements as is really necessary. In some of our cities, such as Ottawa, there are not hundreds but hundreds of thousands of yards of road frontage unoccupied by buildings and forming a burden of cost upon the owners, largely because of the shallow nature of the subdivision. When, in addition to this extra width of frontage, you have an unnecessary width of road, the wonder is not that land development is so expensive in Canada, but that it is so reasonable in cost.

Even when we come to consider bridges and culverts, how often have we to face unnecessary difficulties owing to lack of planning of lines of our roads. The need for dust prevention has a close relation to the question of making unnecessary width of pavement, and who that has studied the enormous cost of maintenance but has been forced to recognize that half of the trouble is in maintaining more surface than the community can find capital to construct properly at the outset.

Col. Sohier is to read a paper in which he will claim that roads should be built to suit the traffic over them. That is a claim which one would think need only be stated to find unanimous acceptance, and yet in actual practice we have paid little attention to it in planning and designing our roads. One principle that has often guided municipalities in determining width of roads is that the road has to be wide in order to secure sufficient air space around the buildings. In some towns it is laid down that roads have to be 60 ft. wide for purposes of air space, and yet the owners of the land are allowed to build up almost every available yard of their site with buildings, and there is a complete absence of air circulation except in the streets. If we are unable to devise means to secure adequate air space and light to our buildings, except by means of making wide roads, I suppose we must adhere to it, but to permit this would be to admit failure to control a matter which is now being controlled by most civilized countries in Europe. We have to recognize that provision of air space is entirely separate from the question of street width, and that adequate air space should be provided by those who erect the buildings and not by the public as a whole. Streets are for the purpose of giving facilities for circulating traffic and for providing access to buildings, and they should be designed for that purpose only.

There is probably one matter only in respect of which the width of streets has a direct relation to buildings, and that is in respect of the height of buildings. Such heights should have some relation to the width of the street. That is needed

not only to secure light and air, but to prevent traffic congestion as the town grows. Apart from that question, however, we should determine the question of light and air to buildings by fixing a minimum distance between all buildings on opposite sides of the street without regard to the width of the street itself, by limiting the amount of land in the subdivision which should be occupied by actual building and by requiring a minimum angle of light to all windows. It may be a revelation to those who on this continent are indifferent to the question of heights of buildings to know that London with its comparatively low buildings is regarded by English architects and engineers as not being sufficiently restricted in this respect. The height limitation in London is approximately 100 feet, and it is considered that this height should only be permitted in streets of 100 feet in width. Apart from special cases where the evil of high buildings has already been established, no buildings should be higher than the width of the streets facing them. Ample justification could be given from every point of view, including that of the interests of real estate, for such a limitation.

In considering the planning of streets and roads we have to deal with four classes of areas:

(1) Areas already built upon, like the developed portion of the City of Toronto.

(2) Suburban areas which are likely to be used for building purposes in the near future.

(3) Rural areas, especially those which lie between centres of population.

(4) Sites of new towns which are likely to grow up in the future.

In the former we are, of course, largely handicapped by existing circumstances, and the physical difficulties are such, especially where we have undulating ground to deal with, that it is almost impossible to secure a satisfactory change of plan. At the same time, it requires to be dealt with in a systematic way, although approached from a different standpoint than the areas which are not yet built upon. We have to consider whether it is wise and more economical to widen a street or to make a new diagonal street instead of widening. In that connection, consideration has to be given to the importance of directness of route and to the provision for future expansion. In London several widenings have been carried out, and soon afterwards these widenings were proved to be insufficient. It is nearly always a weakness of administrators that they fail to look far enough forward in fixing the width of main traffic routes. The great cost of carrying through improvements in such areas is one of the strongest arguments in favour of planning areas not yet developed. In the city of Leeds, in England, extensive improvements have been made at great cost. The City Engineer, Mr. W. T. Lancashire, recently stated in a paper that the improvement schemes in Leeds had cost over twelve million dollars. This, he has claimed, furnished a definite admission of wrongdoing in the past and a powerful justification to town-plan new areas in order to save such expenditure in the future. There is not only the actual direct saving, but there is the enormous saving of time and cost to manufacturers and the community in general by having main streets of sufficient width.

In a memorandum prepared for the Royal Commission on Traffic by Sir J. Wolfe Barry, it was estimated that the wastage due to delay caused by insufficient means of locomotion would amount to about thirty millions annually in London in the earning capacity of the workers alone. With our high wages in Canada and the need for stimulating our industries there is nothing more important than the conserving of the earning capacity of our workers.

In Leeds the cost of widening streets was demonstrated to be rather greater than the cost of constructing new roads through condemned areas. The Engineer's figures show that the rate per mile for street widening varied from about $1,000,000 to $8,600,000, and that the rate per mile for roads constructed through condemned areas, excluding subways, was from $320,000 to $900,000. In the latter case no allowance is included for surplus land, but in a scheme of this kind power should be taken to condemn more land than is actually required, so that the community can reap some advantage from its improvement by disposing of the sites fronting on the new street or streets. The great Kingsway scheme in London has frequently been referred to as an example of replanning, but it is difficult even yet to obtain accurate figures of the cost of that scheme, which includes all the advantages of excess condemnation. The total estimate of cost was thirty millions. This sum was spent in acquiring an unsanitary area where 3,172 persons were accommodated. The new Kingsway is 100 feet wide, includes a tramway subway underneath, and takes the place of a series of narrow alleys and streets which was a danger spot in London. Although the County Council of London is unlikely to obtain a return from the disposal of lands to enable it materially to reduce the first cost, it may fairly be contended that the advantages in directness of route, improvement of alignment, better means of traffic routes and clearness of a very unsanitary district not only justify the expenditure but outweigh any advantage that would have resulted from the widening of the streets that were formerly existing. Generally speaking, in Britain, where the question of reconstructing roads through condemned areas has been a matter of greater expense than in this country, it has been found that it is often cheaper and is nearly always better to construct new diagonal roads than to widen existing roads, where the property fronting on the latter is of a permanent character.

The issue before the engineers of this country is not only to have Good Roads in the sense of having them properly constructed, but to endeavour to foresee and adequately provide for the future expansion of our towns by planning these roads. We want to save costs on minor roads, to lay down main radial roads of adequate width and of good alignment and grade, and to connect up these radial roads in our suburbs by good ring roads. The question of directness of route cannot be considered in isolated streets or areas. Our practice of having straight streets on the rectangular plan, with utter disregard to level and directness of route, is entirely wrong in principle and costly in practice. Curved roads are often an advantage, subject to a view being maintained of not less distance than 100 yards. It is more important to avoid sudden deflections, steep grades, and collision points than easy curves. Curves are often a physical necessity to avoid the removal of enormous quantities of material. Engineers are not sentimentalists but, even as practical utilitarians, they are not indifferent to the value of giving some æsthetic effect to a road, if this can be done without loss of utility. Some regard has to be paid to beauty, to the preservation of trees and to architectural effect, and, as it has been stated elsewhere, relief of traffic is not inconsistent with relief to the eye. I cannot enter into the question of alignment of streets except to urge the necessity of regard being paid to the physical characteristics of the site, to the disposition of buildings and to the need for securing picturesque effects where that can be done without loss of utility.

I have endeavoured to indicate some of the evils which arise from want of planning our roads and streets, and some of the principles which should guide us in our future action. It is desirable, in conclusion, to indicate some of the

methods which we should adopt to secure the removal of existing evils and the application of sound principles. It has been stated that this Conference is concerned with facts and not with opinions and, so far as suggesting any policy for future action is concerned, I shall confine myself to proposals that have been tested by experience. But it is as well to remind ourselves that so-called facts and experiences are often misleading, and that sound principles, even when not tested by experience, should not be disregarded. Every road engineer knows how easy it is to make a mistake in accepting the experience of one locality or of an isolated case as a guide. That does not arise when our facts are based on sound general principles. We have still to gain much practical experience in regard to planning our roads and streets, and as time goes on we shall learn lessons which will correct and alter our views regarding details but, on the main principles of whether we should plan our systems of communication or leave them to chance growth and to the tender mercies of the subdivider, I claim that we all have enough experience to enable us to accept the former as sound in practice as well as theory.

How, then, is it suggested that we should proceed? We have the example from what has been done in Britain under the Town Planning Act of 1909, and I shall briefly refer to the schemes which have been carried out under that Act so far as these schemes deal with the planning of roads. In Birmingham, the Engineer has prepared a plan of the arterial road system which it is proposed to adopt within an area of 43,537 acres. Several town planning schemes have been or are being prepared to deal with the whole of the undeveloped area within the city, and with some areas outside the city. The schemes include provision for main arteries from 80 ft. to 100 ft. wide, and secondary arteries of from 40 ft. to 60 ft. wide. Only the lines of the principal roads are fixed under the scheme. The corporation will make these roads at its discretion, but owners have a right of appeal against delay. The owners of land along the frontage of such roads will, as soon as their land is used for building, contribute $17.50 per yard lineal on each side; this is about half the cost of the street, and is the proportion they would have to pay if the streets were of by-law width (45 ft.). All other subsidiary streets, although not put on the plan, have to be laid out in conformity with the arterial road system at the expense of the owners. They have to be made of such widths and on such sites as the Corporation may require and, when an owner wishes to develop a portion of his estate, he must submit a plan of the streets for the whole. This method secures co-operation between the Corporation and the owners, apportions the cost of street-making in an equitable manner, secures wide streets or narrow streets as the case may require, and allows of elasticity to meet altered conditions. In some cases not more than twelve houses and in others not more than fifteen or eighteen can be erected on the acre on an average, and parts of each area are limited for use for residential purposes, other parts for manufacturing purposes, and others for open spaces.

The schemes include provision for compensation for betterment, demolition of buildings, air space round buildings, and adequate building lines. As far as practicable, building lines of 15 ft. from the road boundaries are secured, with a minimum width of 72 ft. between all buildings on both sides of a road. Thus, on the main arteries of 100 ft. width, the distances between the buildings will be not less than 130 ft., and on the narrowest roads not less than 72 ft. The following are details of the alternative cross sections:—

(1) Roads on plan to be constructed by Corporation:

100 ft.—Primary section—Pavement 35 ft., Grass 43 ft., Sidewalks, Kerbs, etc. 22 ft.
Ultimate " —Same construction but with street railway laid in the grass.
80 ft.— —Pavement 35 ft., Grass 22 ft., Sidewalk, etc. 23 ft.
60 " — " 32 " " 14 " " 14 "
50 " — " 32 " " nil. " 18 "
42 " — " 26 " " nil. " 16 "

(2) Alternative Sections for estate development:

82 ft. between buildings..	60 ft.—	Pavement	18 ft.,	Sidewalks	12 ft.,	Grass next boundary				30 ft.
	50 " —	"	18 "	"	12 "	"	"	"		20 "
72 ft. between buildings..	42 " —	"	18 "	"	12 "	"	"	"		12 "
	36 " —	"	18 "	"	10 "	"	"	"		8 "
	20 " —	"	8 "	"	12 "					

The latter must not exceed 150 ft. in length and have a turning place for carriages. It is intended to meet cases where a few houses are erected on a carriage drive, leading out of a through thoroughfare. These schemes deal with numerous other matters, but the above indicates some of the provisions regarding streets which are likely to be of interest to this Conference. The Corporation will probably spend $50,000 in preparing these schemes, getting them approved, preparing surveys, sections and estimates for arterial roads, etc. In addition to that, it may have ultimately to spend up to $2,000,000 in carrying out its own part of the cost of construction. But this is in a city of about 1,000,000 inhabitants with an area of over 43,000 acres, which has been spending tens of millions of dollars in street reconstruction in the past and, even with such expenditure, securing inadequate results.

I have only time briefly to refer to another scheme for what is practically a rural area, although it is likely to undergo rapid development in the near future. In the Ruislip Northwood scheme, dealing with an area of 5,900 acres, a scheme has been prepared fixing the lines and widths of the main arterial roads and how cost is to be met, securing that all future subdivisions will conform to the skeleton plan, without definitely fixing the lines of subsidiary roads; fixing building lines on all existing and proposed roads at a distance of 15 ft. to 35 ft. from the street boundaries; widening existing streets and adjusting boundaries; diverting or stopping up indirect or unnecessary highways; fixing proportion of land to be built upon, cubic space per room, height of buildings (in no case higher than width of street), delimitation of areas for factories, workshops and residences, character of design of buildings, protection of trees, prevention of unsightly advertisements, reservation of land for open spaces, etc.

The cost of preparing this scheme has been $5,000. The ultimate cost to the ratepayers of carrying it out will be about $150,000, divided as follows:—

Land for open spaces, cemeteries, etc.....	$30,000 00
(Over 90 acres of open spaces were given free by owners, by co-operation under the scheme.)	
Compensation and purchase of buildings for widening.....	20,000 00
Making and altering roads	100,000 00
	$150,000 00

This expenditure will be met in the future as the need arises, and as the benefits are derived by the community. For this small sum, this local authority has obtained advantages which, if obtained piecemeal, would cost ten or twenty times as much. The improved road system or the amount of open space obtained are, either of them, worth the expenditure. These enormous advantages are the result of planning and of co-operating with the owners before development takes

place. The owners benefit as well as the local authority, and an added security is given to the purchaser of property. About 200 municipalities are at work in England, either preparing similar schemes or getting authority to prepare them.

In Canada, Town Planning Acts have already been passed by the Provincial Legislatures of Nova Scotia, New Brunswick and Alberta, and others are considering the matter. Those who are interested in Good Roads and in the planning of roads should support the movement to have similar legislation in the other provinces and to encourage its application in the different municipalities. Such an Act must follow certain definite lines, and the following is an outline of the powers which it should contain:—

Each Province should, within a specified time, prepare a skeleton road plan of the main arterial roads, on which would be fixed the lines and widths of those which connected centres of population.

Every city, town and municipality should be required to prepare a set of town planning by-laws within a specified time, or should be permitted, as an alternative, to prepare a town planning scheme. In the preparation of such by-laws or scheme, regard would of course have to be paid to the road plan of the Province. The preparation of by-laws would be compulsory, but the preparation of the more expensive or elaborate scheme would be optional. Small towns and rural municipalities would probably content themselves with the preparation of by-laws, but the larger cities would no doubt prepare schemes. If in a large city or town a scheme were desirable and by-laws insufficient, it should be open to a body of ratepayers to petition for a scheme to be prepared.

The objects of the by-laws or a scheme should be to secure proper sanitary provisions, amenity and convenience in regard to all matters connected with the development and layout of land in a specified area. "Convenience" would cover all questions regarding roads and streets, including main arterial roads and narrow residential streets. There should practically be no limit to what a scheme could include, subject to its being approved, and it would be necessary for elaborate maps to be prepared to illustrate its provisions. By-laws should be limited and should refer to specific matters, which should be set out in a schedule to the Act; no maps would be necessary, and there would not be the same scope for the exercise of discretion. They would be required to provide for (1) Distances between buildings to be erected or reconstructed on all roads, say 60 ft. to 100 ft., according to circumstances; (2) Widths of prescribed main arterial roads and reservation of land for same; (3) Limitation of dwellings to each acre, and of extent of each site to be occupied by buildings; (4) Light and air to windows and height of buildings; (5) Prescription of use of land for factories, dwellings, etc., and provision for narrow streets of short length in residential areas. Model by-laws should be prepared by a central Department as a guide to each local authority.

Every local authority should be required to appoint a local town planning board, with the local engineer or surveyor as executive officer, and every State or Province should assign the duty of working the Act to one of its Departments, preferably the one dealing with Highways or Municipal Affairs.

Sanction to prepare a town planning scheme should be obtained by the local board from the Provincial Department, which sanction should secure that while the scheme was being prepared no owner should have power to contravene or interfere with the proposed scheme. No subsequent subdivision in any municipality should be permitted which was not first approved by the local board.

The Provincial Department should make regulations as to procedure, and after a period of time should prepare model provisions as a guide to show what a scheme might reasonably include.

Provisions should be made in the scheme for raising funds to carry it out, and local authorities should be permitted to borrow funds necessary to prepare schemes up to certain percentage of assessed value.

Compensation should be payable for injury caused by (*a*) making the by-laws or scheme and (*b*) executing the by-laws or scheme, and provision should be made to enable "betterment" to be claimed for increased value in respect of the same two matters.

Property should not be deemed to be injuriously affected by reason of provisions which prescribed the space about buildings, limited the number of buildings to be erected, prescribed the height or character of buildings, which the central Department regarded as reasonable for health and amenity.

The local board should have power to purchase land by agreement or expropriate under the Arbitration Act, and to expropriate land within 200 ft. of the boundary lines of any street, public park, etc., which it had laid out or improved under the scheme.

No new town site should be subdivided until the plan was approved by the local board.

The above is a brief outline of the requirements for an Act which would automatically secure the planning of each province and municipality—under simple by-law regulation in the rural areas, and by more comprehensive schemes in the cities and towns. It would greatly simplify the procedure necessary under a purely optional measure, and reduce friction between adjacent local authorities. It would provide us with an effective basis for a constructive policy in regard to Good Roads.

The Acts of Great Britain, Nova Scotia, New Brunswick and Alberta give most of the powers set out in the above outline. The suggestion with regard to a compulsory by-law system as an alternative to preparing schemes is new and is partly designed to meet the special cases of municipalities with thinly scattered populations, no expert help, and with small resources, and is also put forward as an improvement on the British Act, after consideration of the lessons derived from some years' experience of its working. A revised Act on exactly the above lines is now before the Legislature of Nova Scotia, and it is also being considered by the Commission of Conservation for the purpose of recommendation to the other Provincial Legislatures.

It has been suggested that such a measure is too advanced and too democratic for this continent. That may be so in the United States, where their Constitution so frequently prevents them from carrying out their democratic principles, but it need not be so in Canada. St. John, N.B., is the city which has the credit of being the first to apply the Act in Canada. It is proceeding with the preliminary steps, with a view to preparing a scheme for about 10,000 acres, of which over half is outside the city limits.

To secure the application of democratic principles, there must be regulation of the abuses of liberty, protection of legitimate private interests, and consideration of the liberty of the citizens as a whole in contra-distinction to the liberty of individuals. We flatter ourselves that we live in a state of government based on democratic principles and yet, so far as the planning of our roads are concerned, we follow the policy and principles of the anarchist. The result is that, owing to a false and mistaken view of the relation between private and public interests, we allow both to suffer. That has been so in the past, but we have now arrived at a stage when both expert and average public opinion recognize the absolute need for exercising foresight and common sense in regard to the whole question of planning our system of roads, particularly in our growing cities and towns. All we now have to do is to agree on the right principles on which to proceed, and it is with the object of indicating some of these principles and illustrating the extent to which they are being adopted in practice elsewhere, that I have contributed this paper to the Conference.

THE CHAIRMAN: I have much pleasure in asking Major T. L. Kennedy to take a seat on the platform, as Honorary President of the Good Roads Association. He is on his way to the front to fight for his country, and it is with the greatest of pleasure that we welcome him here. (Applause.)

Major Kennedy: I feel very much like a man who was walking along a road when an automobile came along and killed a dog. The man running the automobile stopped, got out, and asked if $5.00 would be enough to cover damages. The pedestrian said, "Certainly"; but when the automobile had passed on, he added to himself, "Now I wonder who owns that dog." (Laughter.)

DISCUSSION.

J. P. Hynes, Esq., Architect, Toronto.

Mr. Chairman and Gentlemen:

There are two points that I think might be brought forward. Mr. Adams has spoken of the concession roads that we now have, and he advocates that we should start to plan the roads of our Province in a better way. He evidently does not think that our concession roads meet the requirements. I would like to speak for the æsthetic side of it. These great arterial roads will no doubt lead to great places of population, and will take little note of the concession line. I hope, that when we do start to build to the great cities of Canada, if they find a really beautiful location in any part of the country, they will divert the road and have it pass through that beautiful spot, so that we may have roadways in this country as they have in Europe, notably in Switzerland, that will become historic. This may be an æsthetic suggestion for the practical work you are considering, but I am sure it is one which will add to the value of the work that has to be done.

The other point is where Mr. Adams speaks of using up all the property for building purposes and leaving only the street for the necessary air and ventilation. In the City of Toronto to-day we are allowing the people to use the streets underground and overground for areas and fire escapes and architectural embellishment, to the detriment of the air space that is required for the public service of these streets. We are also allowing property owners to build as high as they please, without due regard to the relation the height of the building has to the street. There is no question that, if we allow buildings to be erected in excess of the width of the street, we are going to have congestion. That has been a serious question in many cities in the United States. I would like to quote Mr. Adams in a remark he made in Philadelphia in 1911. The question of high buildings and the relation they bore to town planning were under discussion. Mr. Adams was asked what he thought of high buildings, and he said, "I cannot see why you will build cities on the broad plains of America as you have to build them on Manhattan Island. Can you not see that if you congest your perpendicular transportation, you at the same time congest your horizontal transportation." It is the question of elevators and main surface lines. Questions such as these should not be overlooked by a Conference of this kind. (Applause.)

THE CHAIRMAN: The next speaker is one in whom you will all be interested. We have all heard of the splendid system of roads and the splendid management they have of road construction in the State of Massachusetts, and I am sure we are pleased to know that our good friend, the Chairman of the State Highway Commission, has come all the way from Boston to speak to us this afternoon, and I have great pleasure in introducing to you Col. W. H. Sohier.

"TRAFFIC AND ITS RELATION TO ROAD CONSTRUCTION, MAINTENANCE AND COST."

COL. WM. D. SOHIER, CHAIRMAN MASSACHUSETTS HIGHWAY COMMISSION.

I am asked to speak to you about the traffic upon the roads.

The constantly increasing number of vehicles that are using our roads and the constant variation in the character of the traffic, changing from horse-drawn vehicles to motor vehicles, make necessary fundamental changes in methods of construction and maintenance.

TRAFFIC AND ROADS.

In the near future, no doubt, the heavy traffic on our roads will increase greatly, but will be carried by motor truck instead of by wagon, and then, possibly, as is now the case in England, the traction engine, weighing from ten to fifteen tons, may come into general use, hauling several trailers, each carrying from six to ten tons. The roads may have to supplement the railroads in transporting the freight to our larger cities. I believe, however, that in this country, with its tremendous development of trolley roads, the rails and not the roads will take the bulk of this traffic. Certainly I hope so, as the poor road-builder has enough hard problems to solve to-day without having to care for such additional and extremely heavy traffic.

Naturally, the first and most important prerequisite of a Good Road is that it shall carry the traffic of all kinds that goes over it, comfortably, economically, both for that traffic and for that road. The road must be so designed, built and maintained that it shall be at all times in proper condition to bear the traffic to which it may be subjected, and not only at the least cost to the user, but also at the least ultimate cost to the taxpayers, taking everything into account, viz.: interest, sinking fund, yearly maintenance and occasional resurfacing.

Road-builders must consider not only the traffic that is now using any given road to be built or resurfaced or even maintained, but also what the traffic will be in the near future and how much it will increase and what changes will come in its character and volume. After these premises have been ascertained, the road-builder can, if he knows enough, build or resurface or maintain the road so that it will economically and satisfactorily carry its traffic in a series of years.

Without that knowledge he is really entirely at sea; he is likely to make serious and costly errors by determining upon the wrong kind of construction and by selecting improper or unsuitable materials or methods. Naturally, also, he must select the type of road to be built, not only with regard to the traffic to be

borne, but also with regard to the cost of the particular materials in any given locality, and the amount of money he can afford to spend.

Even were I competent, I could not discuss all these topics in one short paper, so I will stick to my theme "Traffic," with possibly a few remarks upon our experience, failures or successes, with certain materials and certain kinds of construction and maintenance compared with the traffic on the road.

Traffic Census on Roads in Massachusetts in 1909 and in 1912.

The Massachusetts Highway Commission in 1909 had a census taken upon the State highways at 238 stations, scattered throughout the State; and in 1912 a similar traffic count made at 156 stations. While the count in 1912 was taken at fewer points than in 1909, it was felt that the percentage of increase and decrease could safely be used to indicate the traffic on other similar roads. A traffic census was also taken at the same time at quite a number of points around the city of Boston on roadways in Metropolitan and Boston park systems. The time and method of counting was identical at all points, and the full returns and methods will be found in our annual report for 1909, and again in the report for 1912. We shall make another traffic census this year.

The vehicles actually passing on the road were counted by observers who were engaged for the purpose. All vehicles were counted for 14 hours a day (7 a.m. to 9 p.m.) for seven consecutive days in August, 1909, and again for seven days in October, 1909, at 238 stations, the daily census at each station being tabulated on a card. This same census was made again for like periods of time in August and October, 1912. At a few important points a count was also made at night, the census at these places covering the whole twenty-four hours.

This average number or percentage is interesting and illuminating for the purpose of showing average traffic and average changes in traffic, its character, etc., but is, of course, of no particular value in determining what the traffic to be carried on any particular road is. The actual number of vehicles varies too much at particular places; it varies from 67 vehicles a day to over 2,400. To be of value, one must take the actual traffic on the road itself or use the figures taken at a place where there is similar traffic. The increase and decrease are of value, however, as showing changes in traffic and in its character and indicating what will take place in future.

To illustrate, on the Revere Parkway, in August, 1912 there was an average of 64 horse-drawn vehicles daily and 1,808 automobiles—97 per cent of the travel was automobiles; whereas, in Somerville the average number of horse-drawn vehicles was 440 and the number of automobiles only 164, or 27 per cent. of the total, and yet the traffic at both places would go into the total and help to make the average. Obviously, however, the two roads have such different traffic to carry that different materials and methods must be used.

Increases and Changes in Traffic from 1909 to 1912.

In Massachusetts the traffic using our roads is constantly increasing, but it is changing much more rapidly than it is increasing. This is conclusively shown by the following table:

Kind of Vehicle.	1909 CENSUS, 238.5 Stations.			1912 CENSUS, 156.5 Stations.			Increase or decrease %
	Av. total No. per day.	Av. No. per day per Sta.	% of No. per Sta.	Av. total No. per day.	Av. No. per day per Sta.	% of No. per Sta.	
Motors:							
Runabouts	4,958.5	20.8	8.5	5,819.0	37.2	11	+ 79
Touring cars	17,950.5	75.3	30.5	27,178.5	173.5	49	+ 130
Trucks	.....	.....	.....	1,800.0	11.5	3	.....
Total motors	22,909.0	96.1	39.0	34,797.5	222.2	63	+ 131
Horse-drawn vehicles:							
1-horse, light	17,033.0	71.5	29.0	8,380.0	53.5	15	-25
1-horse, heavy	11,762.5	49.3	20.0	7,458.0	47.6	14	-3
2 or more horses, light	1,006.0	4.2	2.0	556.0	3.6	1	-14
2 or more horses, heavy	6,205.5	26.0	10.0	3,870.5	24.7	7	-5
Total horse-drawn	36,007.0	151.0	61.0	20,264.5	129.4	37	-14
Totals of all kinds	.....	247.1	.....	.....	351.6	.....	+ 42

The foregoing figures represent a traffic count taken in 1909 and 1912 for fourteen days in each year, and from 7 a.m. to 9 p.m. on each day. You will note that the total number of vehicles using the road has increased 42 per cent. in three years, a notable increase in traffic surely. This is not the most significant feature for the road-man, however. The change in the traffic is what we must consider and prepare for. Motor vehicles have increased in numbers on the average 131 per cent., from 96 to 222 a day; on the other hand the teams have decreased on the average 14 per cent., from 151 to 129 a day, making the net increase only 42 per cent. Here again you do not realize all the factors until you analyze still further; light single-horse vehicles have decreased 25 per cent., two-horse light vehicles 14 per cent., while heavy single-horse teams have decreased only 3 per cent., and heavy teams with two or more horses have decreased only 5 per cent.

Equally interesting for the future may be the fact that, while we had almost no motor trucks in 1909, in 1912 we had an average of over 11 per station per day, or about 3 per cent. of the total traffic in numbers and much more in weight. What will it be in the near future? That is one of the questions we must answer. The increase in motor trucks between our August and October census was notable. The average number of vehicles at each station decreased 72 a day or 18 per cent., while the number of motor trucks actually increased 4 per cent. In one town there was an average of only one truck a day in August, while in October there were 27. In another town there were 27 a day in August and 49 in October. You must realize that our count is taken all over the State, in the country towns as well as near cities, and the figure, 11 trucks, is merely an average. On the State highways near the cities, we often found from 50 to 75 trucks a day, and usually from 15 to 30. On some roads motor trucks constituted over 16 per cent. of the total number of vehicles and actually outnumbered touring cars. Merely to illustrate, I might state that on some of our roads we had 2,100 to 2,400 vehicles daily, and on many we had 800 to 1,000, and yet the average for the whole 156 stations was about 350.

Pleasure Traffic Around Boston.

The census near Boston in the parks may be interesting, but it must be remembered that it is, in many instances, light pleasure traffic. The following figures relate to the census taken in August, 1912.

METROPOLITAN PARKS.

(Mostly Pleasure Vehicles.)

Location.	Total of all Vehicles.	Motor Vehicles.	% motor to total traffic.
Lynn, Prescott Pl. & Shore Res	1,530	1,411	92
Revere, Saugus River Bridge	1,872	1,802	97
Somerville, Alewife Bridge	491	474	97
Medford, Parkway and Main Street	515	492	95
*Sommerville, Wellington Bridge	2,526	2,174	86
*Milton, Mattapan Bridge	2,383	1,717	72
Medford, Malden River Bridge	1,884	1,848	98
BOSTON PARKS.			
(All Classes of Vehicles)			
Prince St., Jamaica Plain	1,934	1,715	89
Commonwealth Ave., a city residential street	3,009	2,634	88
Washington St., a suburban city avenue	1,109	671	60

*All classes of vehicles.

At the last two points there were daily 247 and 296 heavy teams.

Traffic at Night.

We had a count made for 24 hours a day at a few points, and the result may be interesting, so I print a short table.

DAY AND NIGHT, 12 HOURS EACH—OCTOBER, 1912.

—	Automobiles.		Vehicles. (All kinds),		Total vehicles.	Percts. at night.
	Day.	Night.	Day.	Night.		
Lexington	202	59	438	104	542	19
Watertown	373	72	671	141	812	17
Chelsea	103	10	358	53	411	13
Somerville	266	70	689	231	920	25
Boston	358	69	513	94	607	15

I computed several night and day counts for the two years to get an average, and found that on the average the night traffic constituted about 18 per cent. of the total traffic; consequently, one should add about 22 per cent. to the 14-hour day count to ascertain the total number of vehicles.

Increase in Travel Caused by Building a Good Road.

In some instances this is caused more by a diversion of travel from other roads in the neighborhood, than it is by creating a new and pleasant route; in other places it is because a new and pleasant route is furnished, and, of course,

always both causes enter in more or less. Naturally, automobiles have brought in travelling, and put many places upon the map which were not there before, especially in New York and New England, where the woods, lakes, mountains and seashore furnish the great recreation and vacation resorts for the whole country.

Weight of Traffic an Important Consideration.

After all, it is not numbers which tell the story; it is weight, and it is not weight alone but the vehicle by which it is transported, whether by horses or by motor. It is not the tractive power alone that makes the difference, but the tires which support the vehicle; whether iron or rubber comes in contact with the road; whether the vehicle is pulled over the road or propels itself, and thus pulls upon the road surface. All of these considerations, in my opinion, are probably not as important on many road surfaces as the actual weight imposed upon the road per inch width of tire resting upon the road.

In other words, heavy loads supported upon narrow iron tires, having a weight of over 600 to 800 lbs. for each inch in width of the tire, do vastly more damage to most, if not all, our roads then do very much heavier loads where the weight per inch width of tire is less. Such loads carried on such narrow tires will practically destroy any road surface, except a pavement, in a few months if there are many such vehicles using the road every day.

After careful study they have adopted in England an assumed weight, or coefficient, for each kind of vehicle using the roads, in order to make a fair comparison of the traffic upon different roads where the traffic varies, and to more nearly show what the road must support. It is quite similar to the formula in use in France and on the Continent. I have therefore used it, both for want of a better one and also because it gives a fair basis of comparison. I submit a table showing the weight of the road traffic on our roads computed in this way, with the coefficient reduced to our tons of 2,000 lbs. each in every case, both on the English and our Massachusetts roads.

WEIGHT OF TRAFFIC ON MASSACHUSETTS ROADS.

Motors.	1909			1912		
	Av. No. per day per station	Assumed weight tons	Wt. tons per day per station	Av. No. per day per station	Assumed weight tons	Wt. tons per day per station
Runabouts	20.8	1.45	29.7	37.2	1.43	53.2
Touring cars	75.3	2.23	167.9	173.5	2.23	386.9
Trucks	.....	6.25	.....	11.5	6.25	71.9
Totals	96.1	.....	197.6	222.2	.....	512.0
Horse-drawn Vehicles.						
1 Horse—Light	71.5	0.36	25.7	53.5	0.36	19.3
1 Horse—Heavy	49.3	1.12	55.2	47.6	1.12	53.3
2 or more Horses—Light	4.2	0.54	2.3	3.6	0.54	1.9
2 or more Horses—Heavy	26.0	2.46	64.0	24.7	2.46	60.8
Totals	151.0	.....	147.2	129.4	.....	135.3
Totals of all kinds	247.0	.....	344.8	351.8	.....	647.3

Here again not only are the changes in traffic notable, but the weights are even more important. The average weight per station per day of the motor vehicles in 1909 was 197 tons; in 1912 it was 512 tons. For horse-drawn vehicles it was 147 tons in 1909 and only 135 tons a day in 1912.

The weight of automobile traffic has increased 160 per cent. in three years, while the weight of horse-drawn vehicles has actually decreased 8 per cent. in the same time. While this is true, note what happened—the motor truck has come in with an average number of trucks of 11½ per station, and their weight is nearly 72 tons a day. Weight of teams decreased 12 tons a day; trucks came in with a weight of 72 tons a day—making good the loss in team weight six times over.

SOME ENGLISH TRAFFIC.

County of East Sussex, 101 Stations.

——	Average total No. per day	Av. No. per day per station	Per cent.	Average total weight tons per day	Average weight tons per station
Motors	9,115	90.2	47.5	3,885	384.7
Horse-drawn vehicles	10,087	99.9	52.5		
	19,202	190.1	100.0		

County of Kent, 47 Stations.

Motors	5,171	110.0	39.8	29,844.6	635
Horse-drawn vehicles	7,825	166.5	60.2		
	12,996	276.5	100.0		

A comparison may be of interest, and so I print the foregoing traffic statistics taken in 1911 on the main roads in the County of East Sussex in England, at 101 stations, and in the County of Kent, at 47 stations.

We have here two facts of considerable interest:

First—Motor vehicles constituted only from 40 to 47 per cent. of their traffic in 1911, whereas they made up 63 per cent. of our traffic in 1912, while in 1909 they made 39 per cent. of our traffic.

Second—In total weight of traffic the roads in East Sussex had about the same average weight per station as did our roads in 1909 (384 tons and 344, respectively), whereas the County of Kent in 1911 had a little less weight of traffic per station than we had on our roads in 1912 (635 tons in Kent, 647 tons in Massachusetts).

Width of Roadway, etc.

We must now consider the relation this traffic has, not only to the cost of maintenance, but in determining the most economical form of construction.

Our original standard width of State highway on the main routes was 15 feet of macadam with a 3 foot shoulder of good gravel well rolled on each side, making 21 feet in all. With the increasing traffic, the speed of motors, and width

of trucks, etc., vehicles were constantly forced to turn out on the shoulder of the road; this rapidly wore it down, making necessary a very large yearly expense in keeping the shoulder up and the road safe.

This was not the worst feature, however. When the vehicles came back on to the harder road surface, each one cut off a little on the edge, with the result that very soon the macadam was cut into and destroyed for 1 to 2 feet on each side, and the hardened road surface became only 11 or 12 feet in width and was rapidly getting narrower. You can readily see that a year or two of this process would destroy the whole road.

We have been forced to widen the hard surface to at least 18 feet, both in construction and reconstruction. If we cannot reconstruct, we have adopted what has been done all over England on the main routes; we built up and widened the shoulder on each side so as to secure at least 18 feet in width everywhere and 21 feet on all corners and curves, with 3 foot shoulders on each side. This has resulted in a great saving in the annual cost of maintenance. On a good many miles of main road it has cost us $200 a mile a year to maintain the shoulder alone, which is equal to the interest on $5,000 a mile for additional construction cost. We found also that the traffic spread much more uniformly over the road, both because of the additional width and because we diminished the crown of the road from our old standard of ¾ of an inch to the foot to from ⅓ to ¼ of an inch. The result was that the road surface wore much longer and was saved from the tendency to rut.

We find this additional width is absolutely necessary on the harder pavements, like bituminous macadam and concrete or brick. On roads of this character, the shoulder, being much less strong than the road, would never be maintained, and the road was positively dangerous if the ground on the side was at all soft. The water running off the road washed it away constantly.

We have built and are building all of our roads now at least 18 feet in width and it is none too wide. One of our concrete roads we made 19½ feet. In Detroit I have been over many miles of concrete road, and on their 16 foot roads we constantly had to turn off on to the shoulder, and I often doubted whether we should land back on the road or in the ditch—with the odds on the ditch.

Traffic and Maintenance.

Quantity and character of traffic.
Economical maintenance and cost thereof.
Materials and methods to be adapted to the traffic that the road has to bear.

English Roads.

There is a very interesting and useful paper on construction and maintenance published in connection with the International Road Congress in 1913, this paper giving the experience of five of the most competent road engineers in England.

I am printing a table showing the weight in traffic in tons carried one mile for one cent of maintenance cost.

(All waterbound macadam with or without surface tar)

County.	Weight of traffic in tons.		Average cost.	Weight in tons carried 1 mile for one cent.	Cost of maintenance in cents per traffic ton-mile.
	Per day.	Per annum.	Per mile per annum.		
			$ c.		
Norfolk	39	14,200	206 25	.70	1.45
	96	35,000	80 00	4.50	.23
Warwick	185	67,500	430 00	1.60	.64
	239	87,200	635 00	1.45	.73
	242	88,300	430 00	2.15	.49
*Kent	348	126,700	1,495 00	.85	1.18
Norfolk	359	131,000	366 25	3.70	.28
	385	140,500	281 25	5.20	.20
	390	142,300	275 00	5.35	.19
Warwick	451	164,600	635 00	2.70	.39
Norfolk	504	184,000	251 25	7.55	.14
Kent	528	192,100	1,740 00	1.10	.90
Warwick	609	222,000	1,345 00	1.70	.60
	734	268,000	2,095 00	1.35	.78
	736	268,600	670 00	3.95	.25
*Kent	796	289,800	960 00	3.15	.33
E. Sussex	984	359,000	1,665 00	2.20	.46
Norfolk	1,057	386,000	1,090 00	3.65	.28
*Kent	3,030	1,102,810	10,500 00	1.05	.95
	3,030	1,102,810	8,960 00	1.25	.80
*Surrey	5,694	2,078,300	5,160 00	4.20	.25
	5,694	2,078,300	3,020 00	7.15	.14
Comparison with two Massachusetts Roads.					
Beverly	2,898	1,058,430	3,257 00	3.25	.31
Weston	1,920	699,924	1,993 00	3.52	.28

*Surface tarred.
Period of 14 years.

I have used the English long-ton but have changed the pennies to cents. This table shows that the cost on waterbound macadam roads to carry one ton one mile over the road varies from about a quarter of a cent to one and one-half cents for the maintenance. This illustrates very well, I think, the necessity of the traffic census showing the class and character of the vehicles which use the road, rather than any formula which merely uses an assumed weight for each class of vehicle.

Massachusetts Experience.

We have found on our roads in Massachusetts that the largest cost of upkeep on macadam roads could come from two causes; first, automobile travel, which would disintegrate a plain gravel or macadam road in a month if there were many automobiles. This could be prevented by the use of some bituminous material on the surface, provided the team traffic was not so heavy that it would quickly wear the binder out. A large number of heavily-laden teams, of say three tons or more, would wear the binder out in a very short time. Also, a very large

number of heavy loads carried on narrow tires would wear a macadam road out relatively quickly. Some of the roads that I am showing would be worn from a half inch to an inch a year, if of macadam; whereas, when a bituminous macadam road with a three-inch top was constructed, amount of wear was very much reduced.

The necessity for knowing the kind of travel is well shown by the English tables. On one road in one of the counties it cost one and four-tenths cents to carry a ton a mile, and on another macadam road in the same county it cost twelve-hundredths of a cent. It appears from the English figures that when the cost of maintenance exceeded two-thirds of a cent a ton a mile, it was more economical to use granite block on a concrete base. The cost for annual maintenance of a six-inch block on a concrete base near the docks in Liverpool has been fifty-eight one-thousandths of a cent a ton a mile.

I am enclosing a table of some of the costs of different kinds of street surfaces and pavements in Liverpool.

Table giving particulars of experience obtained in Liverpool with different classes of surface pavement—including life-tonnage and ton miles per yard width per cent of cost.

Pavement.	Tons per yard width per annum.	Life, Years.	Life, Tonnage per yard width.	Cost per square yard of surface.	Annual cost including proportion of capital and maintenance per sq. yard.	Ton miles per yard width per cent.	Cost in cents per traffic per mile.
6-inch Belgium Block....	524,000	18	9,432,000	$2 50	$0 17	17	.058
4-inch Belgium Block....	150,000	50	7,500,000	1 87	07	12	.08
Hardwood	162,000	17	2,754,000	3 37	25	3.7	.272
Softwood.....	204,000	18	3,672,000	2 12	15	7.7	.128
4-inch Pitch Macadam ..	120,000	11	1,320,000	75	066	10.3	.096
7-inch Waterbound Macadam	120,000	1	120,000	.....	18	3.8	.264
7-inch Waterbound Macadam. Tar sprayed..	120,000	2	240,000	25	12	5.7	.18

Tonnages on Roads Board basis, except on exceptionally heavy traffic when it is based on estimated total actual weights.

English Ton = 2240 pounds.

TRAFFIC AND COST ON MASSACHUSETTS STATE HIGHWAYS.

Town.	Amount of Traffic.		Repairs and Maintenance.			Character of Traffic.			Number of Vehicles per day.			
									Horse Drawn Vehicles.			
									Single horse.		Two or more.	
	Total tonnage per day.	Total tonnage per year (300 days).	Cost per mile per year.	Cost per ton miles per year (cents).	Period (years).	Runabouts.	Automobiles, touring cars and wagons.*	Trucks.	Light.	Heavy.	Light.	Heavy.
Ashby	271	81,150	$266	0.38	16	14	65	4	70	16	5	14
Beverly (No. 1)	1,618	485,220	1,104	0.23	15	60	278	8	66	46	4	12
Hamilton	1,199	359,730	200	0.06	15	86	334	31	75	39	2	27
Lynn	3,468	1,040,430	1,081	0.10	9	194	1,365	13	28	19	1	14
Medford-Somerville	1,332	399,570	1,031	0.26	6	44	121	49	47	198	2	193
Milton	1,140	342,210	592	0.17	14	15	50	0	30	77	2	88
Saugus	1,022	306,660	1,334	0.44	14	15	58	78	25	190	3	65
Shrewsbury	1,305	391,500	510	0.13	17	76	407	17	64	60	4	36
Truro	186	55,770	143	0.25	17	7	63	1	15	14	1	3
Weston	1,918	575,280	1,040	0.18	15	115	533	30	167	98	5	59

*1909 Reports used and results increased 70 per cent. to correspond with 1912 Report. Also weight of double heavy teams increased from 2.46 to 5 tons

Explanation of Table.

The above represents actual facts in Massachusetts. It illustrates the misleadingness of statistics if read without adequate knowledge of actual conditions. The variations in the costs shown are due to various causes: Traffic and weight, toughness of stone, whether road has been resurfaced or not, good and bad bituminous materials, and proper and improper use of materials.

A study of each road will prove profitable.

Ashby, with high cost of maintenance, small traffic, can be compared with Hamilton, with more traffic and a small cost for maintenance, per ton. Ashby, built of local stone, comparatively soft, was resurfaced with the same local stone when the road was about 12 years old, 30 tons being used to each 100 feet of road. It is a country road. It had an application of cold asphaltic oil in 1913, one-quarter gallon being used to the square yard of road. Practically the stone had worn down one-quarter of an inch a year.

Hamilton was built of trap rock macadam and it is on a main through route. When the road was eight years old, the stone had worn down about three inches, and the road needed resurfacing. Automobiles had arrived. In 1907, one-half gallon of the heaviest asphaltic oil that can be applied cold was spread upon the road and properly covered with pea stone and gravel. This treatment was repeated for two years. Then one-quarter gallon of heavy asphaltic oil was sprayed upon the road and properly covered. This treatment has been repeated once. The road has been constantly kept patched and sanded when necessary. It is in better condition to-day than in 1907.

Beverly, with a high cost of maintenance per ton mile, can be compared with Lynn, with a small cost per ton mile. Both roads are on main routes. Both were trap rock macadam. Beverly has a large number of heavy ice teams on three-inch tires. It was resurfaced with trap rock when the road was eight or nine years old, 30 tons of stone being used to each 100 feet of road. The trap rock had worn down one-third of an inch a year. In 1910 it was coated with one-half gallon of hot asphaltic oil per square yard, properly covered with pea stone and dust. This failed in one month under the heavy ice teaming, though the same material and methods were used on the next twenty miles of road on the same route, and the surface has stood ever since with constant patching and one-quarter of a gallon per square yard of the same oil sprayed on to the centre of the road, eight feet in width. For the next four years the Beverly road was maintained (except where it was resurfaced) by the use of one-quarter of a gallon of cold oil per square yard, two applications being used for the first year, one each year since. One-third of the road was resurfaced in 1913 with an asphaltic macadam two inches in depth, at a cost of $1.20 per square yard, two and one-half inch stone being used because of the heavy teams and trucks.

Lynn, trap rock macadam, connects with Parkway where only pleasure vehicles are admitted, except on local business. In 1907, one-half gallon of hot refined tar was sprayed upon the road, and covered and kept covered with pea stone and dust. It was constantly patched, with tar and chips. It has been recoated twice with hot refined tar sprayed upon the road and covered as before. It is in excellent condition, but note—90 per cent. of the travel is motor vehicles; it has few teams and fewer heavy teams.

Medford-Somerville, a trap rock macadam, built with the two and one-half inch stone on top. A road 28 feet in width, with heavy city teaming. A stone

quarry on the side crushing 100 to 300 tons of stone a day. This road has never been in good condition since it was two years old. It always has some depressions, although it has been constantly patched, and all depressions filled with trap rock. "Constantly" means daily. It has always been muddy. A part of it was resurfaced with asphalt macadam this year, the portion beyond the stone quarries. The whole road needs it. It has been treated with tar. A part of it has been coated with heavy tar. A portion had three coats of one-quarter gallon each of hot refined tar, covered with pea stone, in one year. It failed, was never in good condition, and we are in doubt whether to reconstruct with granite block on a concrete base, with concrete, or to try an asphaltic macadam.

Milton is a road of the same character with many heavy granite teams going over it. The cost has been high because the trap rock wore out so rapidly under the heavy concentrated loads on iron tires.

Saugus, trap rock macadam on a through route with a great deal of heavy teaming, both teams and trucks. The stone wore out over one-half inch a year. It needed constant patching with additional stone, was never in excellent condition except when recently resurfaced. It had two or three inches of new stone every four or five years. In 1910 it was resurfaced with three inches of asphaltic macadam at a cost of about $1 per square yard. This has stood ever since, but has needed some patching. A portion was built in the fall when it was cold and this portion failed. No bituminous work should be done in cold weather and a temperature of over 60 degrees is vastly better than one of under 40.

Shrewsbury, a through route—too much heavy hot oil was used on it before we understood how to use oil. One-half gallon per square yard was applied on two successive years. It rolled, rutted and was always in bad condition. It has cost a good deal to remove surplus oil, smooth off the bunches and rolls and keep it patched.

Truro, a country road, with little traffic. Built 12 feet wide of four inches of broken stone on sand, the stone being bound with clay. An experiment but a failure. The road was constantly ravelling and needed more stone. It was widened to 16 feet. New stone was added and rolled in and it was coated with light oil in 1912 and 1913 and is now in good condition.

Weston, a macadam road on a through route. Refined tar applied in 1907—oiled with hot oil on surface in 1909 and 1910—maintained with patching until 1912 when a portion of the road was resurfaced with a two-inch bituminous macadam. Two and one-half inch stones of trap rock were rolled hard and about one and three-quarters to two gallons to the square yard of a good grade of asphalt being sprayed in under pressure. This was covered with the smaller stone, rolled, and on some portions of the road a surface application was sprayed of one-third to one-half gallon per square yard, properly covered with pea-stone and rolled. This cost from 90 cents to $1 per square yard. The road is in most excellent condition and we expect to have it wear 10 to 15 years with practically no patching, although we may have to renew the surface coating by spraying every three to five years. We have one road of this kind six years old, that hasn't needed a single patch as yet.

Motor Trucks and the Cost of Road Maintenance.

Mr. H. T. Wakeland, engineer of the County of Middlesex, which is just out of London and has a very large amount of traffic over its roads, has given some

very careful figures showing damage caused to roads by motor omnibuses weighing about six tons each when laden. He took certain roads which had heavy traffic and gave the cost of maintenance (not including watering or cleaning) for macadam roads for three years previous to the motor bus traffic, and the cost per square yard for the year 1912-13. I insert a table:

Road.	Average cost per yard super per annum for three years previous to motor omnibus traffic.	Cost per yard super for 1912-13 since advent of motor omnibuses.
	(cents)	(cents)
A	13.5	25.8
B	11.2	33.1
C	14.1	41.9
D	15.6	16.9
E	9.1	15.4
F	8.7	15.1
G	5.9	16.8
H	5.1	11.1
I	21.5	36.4
J	16.9	42.9
Average	12.3	25.6

This shows that the average cost of maintenance for three years before the motor bus came in was about 12 cents a square yard a year. Since the motor bus was put on, the cost has increased to over 25 cents a square yard a year. The maintenance cost to carry one ton one mile in 1911-12 was 1.2 cents. When the motor bus was put on, the maintenance cost was raised to 1.8 cents per ton per mile. Mr. Wakeland's opinion is that this increase was practically all due to the motor bus. The increased cost of the road up-keep has been found to be about four cents per car per mile, or two-thirds of a cent per ton per mile in the case of a motor bus on rubber tires. In many cases the macadam surface has been practically destroyed by motor bus traffic on hard rubber tires. These were macadam roads in good standard condition prior to the inauguration of the motor bus traffic and more than sufficient to carry the ordinary traffic. The road authorities should be authorized to direct which roads shall and which roads shall not be used by motor vehicles and motor busses, and Mr. Wakeland states, as do the other county engineers in England, that a license fee of $50 a year for motor trucks is entirely insufficient to pay for the increased cost of maintenance caused by the use of the trucks on the roads.

We have seen how the traffic has increased every year, especially since the motor vehicles came into such common use. The cost of the maintenance of our Massachusetts roads has increased with the increase in traffic and as our roads wore out more and more year by year. This is shown in the following table, which includes the cost of resurfacing some of the most worn roads.

Cost of Repair and Maintenance of State Highways, from 1894 to 1914.

Repair and Maintenance.			State Highways.		
Year.	Cost.	Miles.	Av. cost per mile per year.	Miles laid out.	Cost of Construction.
	$		$ c.		$
1894	.....	.....	.....	39.88	.....
1895	.....	.....	.....	50.03	637,847
1896	4,727	89.10	53 05	37.02	458,581
1897	13,267	126.01	105 28	53.25	482,076
1898	20,661	179.26	115 26	42.68	499,783
1899	24,538	221.94	110 56	44.56	407,309
1900	33,562	266.50	125 93	49.40	396,459
1901	31,061	315.90	98 32	61.68	453,826
1902	59,943	377.58	158 75	53.32	466,743
1903	55,083	430.90	127 83	74.17	443.972
1904	51,896	505.03	102 76	60.85	445,745
1905	57,456	565.88	101 53	56.55	509.007
1906	68,382	622.45	109 86	47.92	444,655
1907	106,189	670.37	158 40	39.33	467,944
1908	147,037	709.70	323 47	38.40	564,719
	82,628*				
1909	247,985	748.27	537 39	36.53	431,814
	154,131*				
1910	214,561	784.80	642 28	52.80	462,165
	289,498*				
1911	213,476	837.59	632 86	42.00	412,542
	316,603*				
1912	208,687	879.59	708 39	40.72	366,424
	414,407*				
1913	203,762	920.31	868 13	60.06	909,063
	595,183*				
1914	389,469	980.37	902 50	58.70	1,102,456
	495,370*				
				1,039.85	10,363,130

Average cost of Repair and Maintenance, 1895 to 1907, inclusive, $105 per mile per year.
Average cost of Repair and Maintenance, 1908 to 1913, inclusive, $619 per mile per year.
Average cost of Repair and Maintenance, 1895 to 1913, inclusive, $267 per mile per year.
*Motor Vehicle Fees Fund.

In this connection I am giving a table showing the number of motor cars registered in Massachusetts from 1906 to 1914 inclusive. You will note that the number of automobiles registered has increased from about 7,300 in 1906 to over 84,000 in 1914, and fully one-third of the traffic on our main roads consists of automobiles from other States. You will note also that there were less than 1,000 trucks registered in 1909; and five years later, in 1914, there were 8,000—eight times as many.

Statement showing the number of Motor Cars Registered and Licenses Issued, 1906 to 1914.

——	1906	1907	1908	1909	1910	1911	1912	1913	1914
Autos(pleasure)	6,572	7,733	18,066	23,011	29,792	36,284	46,096	56,712	68,100
Dealers' autos.	755	455	1,905	2,455	3,305	4,920	6,301	7,462	7,898
Trucks	.....	.....	.....	960	1,568	2,623	4,036	5,948	8,053
	7,327	8,188	19,971	26,426	34,665	43,827	56,433	70,122	84,051
Operators and chauffeurs ..	10,083	10,696	13,170	18,251	41,259	51,950	66,645	81,034	95,577
Total receipts	$33,085	$92,096	$121,488	$169,973	$374.789	$477,417	$616,245	$764,153	$914,119

Prior to 1907, certificates of registration did not expire annually. Prior to 1909, trucks were not classified. Between 1903 and 1907, all automobile registration fees were $2. In 1907, the automobile registration fee was increased from $2 to $5. In that year 9,006 cars, registered at $2, were re-registered in the same year at $5. Beginning January 1, 1910, the automobile registration fees were based on the horse-powers of the vehicles, the fees varying from $5 to $25. The fee for registration of a truck, however, was $5 regardless of the horse-power, till 1915, when it was made $5 per truck with one ton carrying capacity, and $3 extra for each additional ton of carrying capacity. Prior to 1910, operators' licenses did not expire annually, but continued in force indefinitely. Since 1910 all licenses have expired annually.

Increase in Maintenance Cost.

Starting in 1907 you will note that our cost for maintenance has risen by leaps and bounds from $158 a mile a year in 1907 to over $850 a mile a year in 1913, and it is still higher in 1914.

Our roads were rapidly going to pieces. We needed some money. We got the Legislature to double its appropriation of $100,000 a year and make it $250,000 for one year and $200,000 a year since. We secured an increase in the automobile fees, and had four-fifths of that money available for the maintenance of State highways, and the other one-fifth for the improvement or maintenance of through routes in the towns.

Borrowing for the Construction of Highways.

As you will see from the above table our State Highways in Massachusetts have cost about $10,000,000 in 22 years, and we have built over 1,000 miles. Under our law, the counties repay one-quarter of the cost of construction and maintenance. We originally borrowed the money on thirty-year bonds with an adequate sinking fund provision; to-day we are issuing serial bonds for fifteen-year periods.

The question is often asked whether it is wise to borrow money to build roads with. That all depends on how soon you want to secure your roads. You never should borrow money to build roads unless you are reasonably sure you can maintain them. Taking our experience in Massachusetts, it was not a wasteful financial policy borrowing the money. We have secured 1,000 miles of good highway properly located, constructed, graded, drained, and surfaced. These highways have cost the State $10,000,000 and actually cost more money, because the municipalities have themselves contributed between one and two million dollars towards the cost of construction. Our net debt to-day, because of the sinking fund and the repayments made by the counties, is under $6,000,000, and it is extremely doubtful, to say the least, if these highways could be replaced in their present condition for their original cost of eleven to twelve million dollars, and they certainly could not be replaced for the six million which we still owe. Since we commenced building, the cost of construction has increased at least fifty per cent., because of the increased cost of labour and materials, shorter hours, etc. Then, too, the people have had the use of these roads for many years; that's worth a great deal. Taken as a whole, they have been adequately maintained, because they are in better condition to-day than they were three years ago. If we continue to maintain our roads until the bonds are paid, we shall then have a valuable asset which will have been paid for.

Another consideration, again assuming that you will be able to maintain your roads until the bonds are paid, is how much is the money worth to each individual taxpayer at the time when you borrow the money rather than collecting it as taxes. The State can borrow money for a much lower rate than the individual. Very probably, especially in a growing country, the money may be worth more to the individual for the development of the country and its resources, than the amount that it costs the State for interest and sinking fund; in which case the community as a whole may be better off by having the money borrowed. To illustrate, if any given property-owner's share of the tax, if it were collected, was $1,000, and he retained his thousand dollars and got six or seven per cent. on it, compounded for a period of say thirty years when the bonds ran out, and the State only had to pay interest and sinking fund at our rate of 5 65-100 per cent., he or his successors would have made quite a large profit in the difference in interest between what their money was worth to them and what the State had to pay, and would also have their money left. Of course, the highway should be given credit for the benefit the communities secured from the use of a Good Road for many years past.

I think the proper answer in each case depends on what you want to accomplish. If you wish to secure a large mileage of improved highways, in other words, a comprehensive system of main trunk lines, in a few years, you should borrow the money if you can keep the roads maintained. If you are merely going to improve a few miles of road from year to year through a series of years, it is much better and costs less in the end if you secure the money by taxation every year.

Maintenance Costs Elsewhere.

That our costs are not excessive nor our experience unusual is well shown by the experience of both France and England. A few facts about the road systems in those countries will be instructive.

Maintenance of French Roads.

They established their French road system beginning in 1826, and constructed their total road system of 371,000 miles in about the next 25 years.

Their roads, practically uniform except as to width, have been built almost entirely of local macadam originally, 6 or 8 inches deep on a proper foundation. In resurfacing some of the main roads in later years they have used a harder stone and Welsh or Belgium granite. The macadam surface of the road on the Routes Nationales is 24 feet; Routes Departmentales 18 feet; and the roads "de grande communication" and "d'interest commun." 15 feet. The yearly cost of maintenance has been $273 a mile on the Routes Nationales, this maintenance cost varying to $78 a mile on the 184,000 miles of ordinary country road of only local interest.

The French engineers last spring estimated that some 8,000 miles of road ought to be resurfaced, using a tar macadam, because of the large increase in automobile travel around the cities, which travel was rapidly destroying their macadam roads, and they requested the Government to furnish $60,000,000 for that purpose, about $7,500 a mile.

Their greatest problem for over 50 years has been maintenance. The roads are maintained practically by a central organization. The whole country is

divided into 86 departments, and all of the county and rural roads within the department are managed by the prefect of that department, and the expenditures appropriated by the council. Direct charge is in the hands of a centralized body of competent engineers, about half of whom are graduates of the National School.

Each department is divided into four or five political districts, each district being called an arrondissement, and the roads are in charge of a district engineer, who is under the direction of the chief engineer. Each arrondissement is again divided into districts or cantons, and an assistant road engineer under the direction of the district road engineer looks after all the county and rural roads within the canton. Then comes the final subdivision, where the roads are divided into sections of a few miles long, taken care of by patrolmen. All of these are under civil service and the men are promoted from time to time according to their ability. The table shown below gives the approximate cost of maintenance on the French roads, annually:

	Miles		Total Expense	Per Mile
Routes Nationales	23,800		$6,500,000	$273
Routes Departmentales	8,100	115,400	1,500,000	185
Chemins Vicinaux De grande communication	107,300		16,900,000	157
D'interest commun	47,500		6,000,000	126
Ordinaires	184,700		14,500,000	78

Five or six patrolmen are under a foreman, who is also a patrolman. When any resurfacing or reconstruction is to be done, they use machinery, rollers, etc., belonging to the department and collect together enough of the patrolmen, with a section foreman, to reconstruct the road under the supervision of the district engineer. This provides them with men who are thoroughly familiar with the work.

You will note that the French engineers state that on the main roads near the cities the $273 a mile a year for maintenance is not keeping the roads up; that they need $60,000,000 to resurface with tar macadam 3,000 miles of these roads at a cost of about $7,500 a mile; that is, practically one-third of their main roads should be of tar macadam. If this expenditure is made in say a five-year period, or $12,000,000 a year, it will increase the cost of maintenance on their 23,800 miles of national roads about $500 a mile a year for resurfacing on the average, and will make their total maintenance charge on their main roads $770 a mile in place of the present cost of $273 a mile. Of course, if spread over a ten-year period, it would only increase the cost half as much; the present roads would be practically impassable. This is in accordance with our Massachusetts experience on our State highways where our expenses per mile including resurfacing averaged over $850 in 1913.

Maintenance of English Roads.

Originally there was no road system in England. Everyone made his own road. Then came "Statute Labour," which was required by a general act passed in 1555. This practice was not superseded by highway rates until 1835. The roads were cared for by the parishes, and a little later several parishes were combined in a highway district.

In 1663 England began to pass "Turnpike Acts," authorizing the creation of a corporation with trustees, who were to build roads, maintain toll gates and charge tolls. By 1833 Parliament had passed 3,800 Turnpike Acts, and created in

England and Wales 1,116 turnpike trusts, controlling 22,000 miles of road. They almost all failed and in the 22 years after 1864 the number of turnpike trusts was reduced from 1,048 controlling 20,589 miles of road to 20 trusts with 700 miles of road.

In 1878 the cost of these main roads which had been "disturnpiked" was placed upon the counties. In order to even up the expense more or less, the English Government made appropriations to aid in the maintenance of these main roads, beginning in 1882 with an appropriation of about $800,000. In 1888 about $2,500,000 was appropriated, and now the Road Board has something over $6,000,000 annually which can be spent in improving the main roads.

They have now a combination of the county taking care of the urban and rural main roads, with the parish and local authorities taking care of the rural roads. The main roads are something over 20 per cent. of all the mileage, leaving out London. In almost all of the counties they have sections of road in charge of regular maintenance men. They have almost universally been obliged to give up the old system of patching the roads by putting in loose broken stone from the roadside because of the large number of automobiles that threw it out so rapidly, and they have substituted patches made of either tarred stone or tarred slag, or the patches are made by a painting method using stone chips and dust.

Most of the main roads in England, outside of Metropolitan London and the other large cities, are maintained by the use of tar. Some 40,000 miles of road were tarred in England last year, and some 6,500 miles were built of tarred macadam. Their system of maintenance now is not only to keep the roads constantly patched, but every year or twice a year on their macadam roads they usually flush them and roll them, filling the holes and depressions first and adding a small quantity of chips and stone dust. On the tarred roads a section man keeps them constantly patched. They usually require a fifth or a sixth of a gallon of tar per square yard, which is sprayed on once a year, and this is covered with pea stone or gravel and kept covered so it won't pick up. The tar is usually sprayed on under pressure.

Where they have heavy traffic, they are resurfacing their roads with tarred Welsh granite, which is like our trap rock, or with Tarmac, which is a tarred iron slag. They also build a road of three-inch stone, rolled hard, and grout it with a mixture of hot sand and hot tar, equal volume, poured into the road until it flushes it, and roll in 1½-inch stone and smaller stone with a surface coat of tar and sand. They find their macadam roads with a tarred surface require re-treatment every year. This costs about 2½ to 3 cents a square yard a year. On the tar-mix roads they require a new coat of a fifth of a gallon of tar applied on the surface every two years.

I am giving you in a table the cost of maintenance on the various classes of road in England, in which you will see that the average cost is $1,100 a mile a year to maintain the county urban main roads, and the county rural roads $431 a mile a year, while the rural roads which are merely of local interest cost about $122 a mile a year to maintain.

	Miles.	Maintenance	Authorities, County Engineers.	Yearly Maintenance per mile.
		$		$
County Councils:				
Urban Main Roads	4,189	4,601,790	61	1,100
Rural Main Roads	23,565	10,177,740	.....	431
	27,754	14,779,530		
County Boroughs	9,366	6,437,380	28	685
London Authorities	2,192	3,691,355	2	1,680
	11,558	10,128,735	30 Road Authorities	.....
Urban Roads	11,411	4,848,020	1,733	425
Urban Roads	4,871	2,701,710	.....	555
Rural Roads	95,077	11,562,920	.....	122
	111,359	19,112,650	.....	.....
Totals	150,671	$44,020,915	1,898	290

The total expenditures per year, including improvements and interest, $75,990,000.

Conclusion.

A road means a highway that can be traveled over with reasonable convenience and with reasonable effort by ordinary vehicles. Two ruts and a horse track with six inches of mud and large potholes scattered frequently over its surface do not constitute a road. A road to be a road worthy of the name must be constructed and maintained so that it will at all times satisfactorily and economically bear the traffic which passes over it.

Good drainage, foundation whenever necessary, and a top surface always maintained so that it will shed water, are necessary prerequisites. If any one of them is missing you do not have a Good Road. Constant maintenance is eternally necessary; drainage must be always open, and road surfaces must always be maintained. The most economical way to maintain a road is by constant maintenance.

With modern Massachusetts motor vehicle travel, a newly-built macadam road without any bituminous materials having been used on it will easily be destroyed in one month, so far as its surface is concerned, and will be damaged so that it will require 15 to 25 cents a square yard to put it back into condition so that some bituminous material can be used.

Roads and road surfaces must bear the traffic that goes over them. The tables I have printed show conclusively how expensive it is if materials are not used and methods are not used with those materials, so that the road can withstand the traffic which goes over it. I think by a study of the tables and our experience, you can gather, knowing the traffic on your road, what will probably be the most economical way to construct or reconstruct your road. With a certain volume and weight of traffic, granite block on a concrete base will perhaps be the most economical, especially for heavy concentrated loads. Thirty-ton loads on four wheels are very common near the docks in Liverpool, where six-inch granite block on a concrete base has worn 18 years.

In figuring costs you must figure what the road has to bear in tons or otherwise. Speaking in round numbers, you will find on figuring the English roads

and American roads that it costs about a cent a vehicle a mile per year to maintain the roads. It would not surprise me if the same were true on dirt roads. Dirt roads, of course, will not stand very much heavy teaming, no matter if they are kept constantly patched.

This money you must have and it must be properly expended if your original cost of construction is not to be lost and you are not to find yourself saddled with a debt on which you are constantly paying interest years after the road has passed away in dust. But you must go further than that and figure what are the proper methods, proper materials, and the best and most economical surfaces.

For merely automobile travel, cars on pneumatic tires, you can economically and satisfactorily maintain a gravel or macadam road in the summer season by the proper use of a good bitumen and constant maintenance and patching. You can maintain a waterbound macadam road, if the traffic is not too heavy (and by too heavy I mean too much teaming) by the same methods. You can maintain a bituminous macadam road more economically than either of the above roads when the traffic in teams or trucks is so heavy that neither of the other roads is economical. With heavy concentrated loads that will crush or wear a trap rock macadam, say at the rate of from one-half inch to an inch a year, waterbound macadam is not economical, either with or without a bituminous surface. Bituminous macadam will be much cheaper in the end. That is, of course, provided bituminous macadam can withstand the traffic that goes over it. With a certain volume of traffic it is more economical to construct a pavement probably on a concrete base or possibly in some places a concrete road.

You will note that the increased cost on many waterbound macadam roads in England, when the motor bus service was put on, was substantially four cents a mile for every mile that the busses, which weighed six tons including their load, went over the road. Proportionately, a small runabout would probably cost about a quarter of a cent, a large touring car from one to two cents, and probably a heavy horse-drawn vehicle with a three-ton load would cost about the same.

Constant maintenance costs money. Our labour costs are much in excess of those in France and England. Our materials probably average the same, though in Massachusetts our stone is cheaper than the French or English imported Belgium or Welsh granite, which is practically a hard trap rock. You will note that all the French roads, even little country roads, cost over $100 a mile a year on the average to maintain. You will note that even the little country roads in England have cost more. You will note that the French engineers practically state that they need $770 a mile for many miles of road on their main roads to adequately maintain them; that the English county engineers spent $1,100 a mile on the average on their main county roads; and that we in Massachusetts are spending $850 a mile. These figures, of course, include not only ordinary maintenance but resurfacing when say one-half of the original road surface has worn off.

The people must be made to realize that if the original investment in roads is not to be lost, adequate provision must be made for the maintenance of the roads, and the money secured from some source.

Remember that while

> The Knights are dust.
> Their swords are rust.
> Their souls are with
> The saints we trust,

the bonds will be presented on Resurrection Day.

A DELEGATE: How thick do you put that gravel on a macadam road?

COL. SOHIER: Three inches rolled to two.

THE CHAIRMAN: I am sure you are all pleased with this address we have had from Colonel Sohier, and we appreciate his address very much indeed. The discussion was to have been led by Mr. Oliver Hezzelwood, but as he is not present at this time we will leave the discussion open.

A DELEGATE: While listening to the address of Col. Sohier and hearing of the great cost of keeping up these roads, it occurred to me that it would be a better way to abandon all these highways and build electric roads and construct vehicles that could travel upon them. I believe that would be a lot cheaper.

A DELEGATE: The electric roads can never take the place of the ordinary highway. You would have to leave your home to get to the electric road, and after you got to town you would have to hire a truck to take your produce to the market or store but, if you have a Good Road, you can put your butter or eggs in your wagon and go right to the door of your customers.

A DELEGATE: If the roads are going to cost as much as they have done, we will soon not need any roads because we won't have anything to keep them up with.

MAJOR CROSBY: I was very much impressed with the remarks of both Mr. Adams and Col. Sohier. I was struck with the fact that a great many would be discouraged by some of the figures given by Col. Sohier. If these figures had been published at the time I was trying to get some road laws passed in Maryland, they would have upset my plans and we probably would have put aside our road improvement for a considerable period.

One point should be borne in mind in connection with the Massachusetts figure of $900 per mile for maintenance, and that is, that Massachusetts was caught in an embarrassing position in a way. The roads of Massachusetts had been considerably improved with waterbound macadam, when the automobile came to be a very prominent factor in transportation. The waterbound macadam is entirely unsuitable for automobile traffic. The figure of $900 per mile for maintenance is a figure for practically building roads for automobile traffic. Maryland was a little more fortunate; she had the experience of Massachusetts to benefit by, and we recognised that the automobile traffic had to be dealt with, and we constructed our roads so as to keep our maintenance at a very much lower figure. There was simply a difference in conditions, and the maintenance on Maryland roads for the past three or four years has never been over $400 per mile, and in many cases it is as low as $150 and $170 per mile. I just want to offer that thought to you as a word of encouragement. If your road surfaces are properly selected and the construction is proper, the maintenance figures can be kept down, and the expenditure will be entirely justified by the benefit which will come from improved roads.

I would like to emphasize the necessity for a proper width of the roadway. Let me say that I consider the roadway as a different thing from and not synonymous with the highway. The highway to my mind is the entire right-of-way to public travel, and the roadway is simply that portion of the highway improved for vehicular traffic. In my judgment, the entire right-of-way is seldom too wide; I have seen many instances of its being too narrow, and in order to make it wider, frequently buildings have to be torn down at an enormous expense. Therefore, I would counsel you to lay out your highways of ample width and build your roadways of sufficient width, and that width will depend on the amount of

traffic. There is no use in building a residential street wide enough for more than the traffic that will come on it. If the roadway is properly designed and there is ample width for the highway, that space can later be utilized for widening the roadway if the demand for that becomes apparent.

We have had some disastrous accidents in Maryland from building the roadways too narrow. On one stretch of road, on what we call the eastern shore of Maryland, that is, the flat country east of Chesapeake Bay, there is a good deal of sandy soil, and there we have the longest stretch of concrete road in this country, probably in the world. It is 28 miles long and is almost perfectly straight. That concrete is only 14 feet wide at the outside. An automobile was proceeding along that road rapidly and met a team. The team did not turn out far enough, and the driver of the automobile got off the concrete on to the loose sand with two of his wheels. The machine skidded and checked the speed of the automobile, and the machine overturned and seriously injured the occupants. I think you will make a serious mistake, if you do not recognize the necessity for wider roadways than existed here before. "Safety First" should be applied to road construction as well as to railroad operation. In my judgment the danger from narrow roadways is proportionate to the rigidity of the road crust. If your road crust is very rigid and the contrast between it and the shoulder is marked, the danger in getting off the road crust on to the shoulder is very much greater than it is where the shoulder and the material of the roadway are of approximately the same consistence.

Col. Sohier: Three or four of our counties were anxious to have electric railways and we went into the matter carefully, and we found that the cost of building electric railways was prohibitive. What frightened them a good deal more than that was that they found that the cost of running an electric road was very expensive. If they did not collect sufficient fares, the cost of running the electric railway would be much more than the cost of building a good highway. The State of Massachusetts did not want to lose a good many hundred thousand dollars in building electric railways. If the State built the railways, the cost of maintaining them would be very great and would very soon eat up the cost of the highways. Major Crosby is quite right; when the motor traffic came we had in Massachusetts over 700 miles of macadam or gravel State highways, and we had at once to use bituminous materials on the top or to resurface them to prevent them from being destroyed. We have one road which was built of concrete in 1906, and there has been very little repair on it, and not a hole in it; it was a country road with few teams, and we coated it with tar the third year.

"BRICK ROADS AND STREETS."

E. A. James, Esq., York County Engineer, Toronto.

At this Convention many types of roads will be described. Each type seems to serve the purpose when used in the proper place. It has long been recognized that the bridge engineer should design for each site a bridge or bridges best suited to that location, but, although this has been true of the bridge engineer, yet the road engineer has been expected to construct on a given highway a pavement irrespective of conditions. That will not be so in the future. Each section of a highway requires careful designing, and over-designing should be avoided as well as under-designing.

Not only must the pavement engineer design a road suited to the weight and intensity of the traffic, but regard must be had to cost and value that will accrue to the community. No arbitrary tabulation can be made, which will be a sufficient guide to use in determining when a brick pavement is desirable. A road to-day may have a traffic of two hundred vehicles per hour, but if this road were improved the traffic would more than double; so in selecting a pavement the engineer must use his imagination and local data regarding distribution of population to estimate the probable traffic under improved conditions. We would offer, however, this suggestion that when the traffic amounts to (or is likely to amount to, in the near future) two hundred iron tire or hard rubber tire vehicles carrying from 500 pounds per inch of tire or upwards, passing a given point per hour, then one would be well advised to use brick or a concrete base.

Of course there are other conditions than volume of traffic. It will often be advisable to pave lands and court-yards, where the weight of load amounts to 1,000 pounds per inch of tire, or on sandy hills, etc. In York County we have paved three hills with brick. The hills have a grade of 9%, yet no complaints have been made in reference to poor traction. Two of these hills have been paved since 1912 and as yet not one cent has been paid for repairs or maintenance.

The roads were paved 16 feet wide at a cost of $24,000 per mile. The same hills would have cost $10,500 per mile to build with macadam, and would have cost annually $400 per mile to repair and oil.

When it is decided that brick should be used the following specifications will be found satisfactory.

Specifications for Brick Pavement, with Concrete Foundation.

(1) *Concrete Foundation.*

Preparing Subgrade.—The subgrade is to be formed to the levels and cambers shown on sections; where the ground is soft or otherwise unsuitable it shall be removed and refilled with gravel, broken stone, or other approved material. The whole subgrade shall then be thoroughly rolled with a roller weighing at least eight (8) tons. Any depressions discovered after this rolling shall be filled with approved material and re-rolled until brought to the proper levels and camber.

Filling in embankments must be applied in layers of four (4) inches in thickness, and each layer thoroughly rolled.

Tile Drains shall be placed beyond the edge of the concrete or in such places as shall be directed by the engineer.

Concrete Foundation.—When the subgrade has been completed, a layer of Portland Cement Concrete five (5) inches thick shall be placed.

The Broken Stone for the concrete shall be hard quality limestone, free from all refuse and foreign matter, with no fragment larger than will pass, in its longest dimensions, through a two and one-half inch (2½ in.) ring, and not smaller than half an inch (½ in.) in its longest dimensions.

The Sand is to be clean, sharp sand and free from clay or other injurious material and to be thoroughly dry when first mixed with the cement.

The Cement used shall be an approved brand of Portland Cement, and will be submitted to the tests approved and recommended by the Canadian Society of Civil Engineers, and any cement failing to comply with these requirements shall be rejected. All cement used in this work shall be properly protected from moisture until used.

The Water used for mixing the concrete shall be reasonably clean, free from oil, sulphuric or other acid and strong alkalies. The cement and sand are to be first thoroughly mixed in a dry state until the whole mass shows an even shade; sufficient water shall be added to produce a plastic mass, fluid enough to settle in place without tamping, but not so thin that water will show on the surface. The broken stone must be tamped before being added to this mixture, the whole mass to be thoroughly mixed or turned over at least three times, so that every fragment is coated with cement mixture.

The Concrete shall be so proportioned that the cement shall overfill the voids in the sand by at least five (5%) per cent., and the mortar shall over-fill the voids in the stone or gravel by at least ten (10%) per cent. The proportions shall not be less than one (1) part of cement to eight (8) parts of the other materials. When the voids are not determined, the concrete shall have the proportions of one (1) part of cement to three (3) parts of sand and five (5) parts of stone. A sack of cement (94 pounds) shall be considered to have a volume of one cubic foot.

The concrete shall be laid while fresh, and within twenty minutes after it has been laid it shall be struck off with a template and as soon as practical trowelled sufficiently to bring the finer particles to the surface and then broomed. When the surface is finished it shall be kept wet for seven days. Care should be taken that the subgrade is kept moist while this concrete is being put in place. The whole of the concrete must be thoroughly tamped and no re-tempering will be permitted. No concrete shall be laid when the temperature at any time during the day or night falls below thirty-five (35°) degrees above zero Fahrenheit.

(2) *Sand Cushion.*

On the concrete foundation shall be spread a ¾-inch cushion of clean sand, free from loam and foreign matter, and sufficiently fine so that it will pass through a one-quarter inch (¼ in.) mesh; the sand must be spread by means of a template made to conform to the true curvature of the street cross-sections, that compression to be done with a hand roller weighing from three hundred (300) to four hundred (400) pounds.

(3) *Brick Paving.*

The Bricks for paving shall be sound, well-burnt paving bricks, showing at least one fairly straight face, free from cracks and excessive laminations, preferably made from shale. They shall not be less than 2½ in. x 4 in. x 8 in., or more than 3¾ in. x 4 in. x 9 in., and shall not vary one-fourth (¼) of an inch in width or depth or more than one-half (½) of an inch in length. The brick shall be reasonably perfect in shape, free from marked warpings or distortion. The bricks shall be carefully laid on edge, with best edge uppermost, as compactly as possible, in straight courses across the street, with the length of the bricks at right angles to the axis of the street. Whole bricks only shall be used, except in starting and finishing orders, all fractional batting to be next to the curbs.

Expansion Joints shall be provided at each curb line and at point as later specified by the engineer across the roadway. The transverse joints shall not exceed three-quarters (¾) of an inch in width, and the longitudinal joints shall be one inch in width. These joints shall extend the entire depth of the pavement and shall be filled with bituminous paving cement; great care shall be taken to fill these joints flush with the surface of the pavement and that no dirt, etc., be left in the joints.

After 25 or 30 feet of the pavement is laid, every part shall be rammed with a heavy rammer, a plank laid on the surface parallel to the curb to receive the blows of the rammer, or a steam roller not to exceed five (5) tons may be used. When a self-propelled roller is used, it shall first be passed slowly back and forth parallel to the curb, until the bricks are firmly imbedded in the sand cushion; the pavement shall then be rolled the entire width of the street transversely at an angle of forty-five (45°) degrees to the curb, repeating the rolling in like manner in the opposite direction. All broken or injured brick must be taken up and replaced with satisfactory ones, which must be brought to true surface by tamping.

(4) *Filler.*

The Filler shall be composed of one part of clean, sharp, fine sand, and one part of Portland Cement, thoroughly mixed dry in small quantities; water is then to be added until a mixture is of the consistency of thin cream, which shall be kept in constant motion until all used up. The filler shall be washed into the joints repeatedly until it appears on the surface.

The sides and edges of the brick shall be thorougly wet by sprinkling before the filler is applied. Care shall be taken that the joints are free from sand, etc., before the filler is applied. After the filler has hardened, a half inch coating of sand shall be spread over the whole surface of the pavement; in dry weather this coating shall be kept damp by sprinkling for three days.

DISCUSSION.

D. T. Black, Esq., Town Engineer, Welland, Ontario.

We have listened with interest to the valuable paper on "Brick Roads and Streets," given by Mr. James. He has illustrated for us the great value of brick as a road-building material, and it is well worthy of discussion. One question may be asked, "Why is brick not more extensively used for highways?" Brick has proven to be one of our best road and street-building materials; its durability has proven that it is not an expensive construction considering its long service and advantages. It is not new to us, its qualities have been thoroughly tested under most severe conditions. Under modern traffic conditions its lifetime is equal to two or perhaps three macadam roads; then why is it not more extensively adopted for highways? The recent investigations into the New York State Highways gave further proof that the sections built with macadam were more costly over a fixed period than those constructed with brick, and with less desirable service. The only answer I can find is, the people of the twentieth century are afraid of the first cost of the work and do not consider the after cost.

I have walked over a part of an old Roman road in Scotland, built of large flat stones, which is still in existence, although not now used as a highway, but had served its purpose for centuries. I have cycled and driven over many miles of roads constructed nearly a century ago by Macadam and Telford, which were under the continuous maintenance systems, and until recent years, with the great increase in automobile traffic, were cheaply kept in repair and were all that could be desired, having a hard surface, smooth and clean in all weathers. Those roads were not constructed cheaply: their construction was of a heavy character with

one specific object in view, namely, durability, which has amply been fulfilled. The cost of construction of those roads, with the earning powers of the people a century ago, must have been as great as the cost of construction of brick paved highways would be to the earning powers of the people at the present day. We cannot accuse the road-builders of the great Roman Empire or Macadam or Telford with the want of common sense or thoroughness in their construction. Instead, we admire their ingenuity, thank them for what they have taught us, and for leaving behind so many monuments of their skill.

While supervising the construction of a large water main, on a highway originally built under the direction of Macadam, I found the stone averaging 15 inches in depth; the original depth was 12 inches, and in some places had been worn down to 8 inches, which the section showed, the bottom 8 inches being composed of stone averaging 1½ inches, which was the favourite size used by Macadam, whereas the repaired part consisted chiefly of a stone varying between 2 and 2½ inches. This road was only one of many excellent roads in the district. It was built of trap rock and had a width of 36 feet. In all weather it was a delight to travel over. I do not give those illustrations with the suggestion that we, of the twentieth century, should construct roads similar to those built by the Romans, or follow the heavy construction of Macadam, but I do suggest that we should still keep before us the main theory of all past construction, namely, thoroughness and durability, to erect something which will have a long life with little maintenance cost.

England has already many miles of her good old highways resurfaced with bituminous and other materials to counteract the heavy twentieth century traffic. Canada has practically only commenced her highway improvement, and now is the time to place "durability" and "long life construction" before us. The roads constructed by Macadam and Telford were handed down as Good Roads to some three or four generations, except for the small cost of maintenance. Why cannot Canada construct with brick or other known durable material and hand down to another generation at least? The bond issue, I understand, is thirty years. Our present stone roads are not wide enough to withstand the wear of present conditions, and if stone roads are to remain where now constructed, they will be renewed several times during that period. The next generation will have some of the present cost to pay, and will surely say, "Our parents were not road-builders, they have left us a debt but no road."

I wish it to be understood that the remarks made apply only to the highways or main arteries leading between our rapidly growing towns and cities, the main thoroughfare used in common by the majority of farmers to the market towns or cities. Canada is now going through a growth and industrial expansion much more rapid than records show for the older countries. Macadam built for the stage coach and horse traffic. Canada must build for the automobile, auto truck and other mechanical freight carriers used by the farmer, fruitgrower and others for industrial purposes. Highway traffic in Canada is already too severe for macadam construction; then why not follow the examples of New York, Ohio and other states, who have proven to us the durability of brick, and are still constructing miles of it annually?

Brick pavements are not only used on highway construction; they are greatly appreciated in many cities and towns. Such a pavement consists of four component parts; namely, subgrade, concrete base, sand cushion and brick surface.

The preparation of the subgrade is usually not an expensive matter where it is of loam or sand. In certain classes of clays it is a different question and is ex-

pensive. Some kinds of clay for refilling trenches ahead of pavement work is most unsuitable; when pounded back dry or lightly sprinkled, it will afterwards settle; when thrown into water, it retains the moisture so long that it cannot be rolled; when heavily sprinkled and pounded, it acts like rubber, rising in one place when pounded in another. To refill with gravel is very expensive. The only method within reasonable cost to give a solid trench, safe for immediate rolling, I have yet tried is by well sprinkling and pounding 6 inch layers of cinders and clay alternately. In the preparation of the grading, concrete base and sand cushion, I prefer the template to any other system, provided the templates are checked occasionally, to detect wearing, warping or bending.

Many of our municipalities situated along the shores of our large lakes and rivers can economically use their natural resources in gravel and sand, without screening, for the concrete base. Lake Erie yields to us a fairly well graded mixture of sand and gravel, containing 37 per cent. of fine aggregate and 63 per cent. of coarse—clean, sharp and free from vegetable matter; and when mixed in proportions of 1 of cement to 6 of gravel and sand, makes good concrete. Testing, however, should always be carefully carried out, as this same lake also supplies a gravel quite as unsuitable, containing as much as 80 per cent. of fine aggregate with 10 per cent. passing a 200 mesh sieve.

The Paving Brick Merchants' Association rules strongly recommend that the sand cushion should be rolled before the bricks are laid. I believe in a 2 inch sand cushion, have tried it rolled and unrolled and favour the latter. My reasons are: when the cushion is rolled the brick surface cannot be rolled enough so as to give as desirably smooth a surface as when the cushion is not rolled; also, the sand forced upward into the joint does not exceed one-half inch and with a strong grout does not materially weaken the pavement.

With grout filler, an expansion joint one inch wide along each curb is generally sufficient when the pavement is straight, but should a deflection of 10 degrees or more be necessary, I find this joint will not properly take care of the expansion. The single transverse expansion joint is not to be commended, so I find better results are obtained when all the joints within the area of the curve are filled with pitch.

The track allowance is a vexed question, and is usually the first part to give trouble. The solid concrete under and around the ties, although more expensive than other systems, are no doubt well worth the extra expense.

The use of T-rails by the street railway companies is increasing, and when nose-blocks are used to give a smooth surface, the results have been far from satisfactory. The principle of construction is not at fault; it is the agreement or charter with the railway company which errs. It should contain a clause forcing the street railway company to keep the grooves clean at all times, as is insisted upon in European countries. The cause of the trouble is easily accounted for. The groove formed with the rail and the nose-blocks becomes a receptacle for mud and street sweepings, and through the continual action of the flanges, the continual addition of sweepings, and the continual compression with the flanges, the under part of the nose-block at its weakest part receives a pressure beyond its strength. The block breaks, which temporarily relieves the pressure. The compression continues into the sand cushion which ultimately heaves the other part of block, disfiguring the street as well as being dangerous to traffic. Some cities have adopted a system without using nose-blocks with considerable success, as far as a more permanent track is concerned, but when first used it is not favoured by the teamsters. This construction does not allow the mud and sweepings to accumu-

late to cause trouble. Instead, the wheels act as fans throwing the dust and sweepings out from under the flange. This form of track work is crowned between the rails; that is, the blocks on the gauge line of the rails are placed below the head and crowned towards the centre, so that midway between the rails the pavement is flush with the head of the rails.

Brick is a most desirable pavement for all kinds of traffic, whether for city or highway construction. It is somewhat noisy, but otherwise the general characteristics are greatly in its favour.

THE CHAIRMAN: The Ontario Good Roads Association has usually held a convention of its own, but, as you all understand, this Convention is being carried on by the Dominion Good Roads Association, and the Ontario Good Roads Association has been giving them their co-operation. Unfortunately, our good friend Mr. McLean was taken ill, and we have had to do the best we could. We have had no authority for doing a great many of the things that we have done, but if we have done anything wrong or if we have not lived up to the aspirations of the Dominion Association, it was just because we did not know any better and did not have the experience.

We have had some most excellent papers and we have had a splendid machinery exhibit and I am sure you will all go away well pleased with the results of this Conference.

The next item on the programme is a business session of the Good Roads Association of Ontario, and I will ask for the report of the Nominating Committee.

REPORT OF NOMINATING COMMITTEE.

(Ontario Good Roads Association.)

Read by MR. W. H. PUGSLEY,

That the officers of the Ontario Good Roads Association for 1915 be as follows:

Honorary Presidents:—N. VERMILYEA, Belleville, Ont.; J. A. SANDERSON, Oxford Station, Ont.

President:—S. L. SQUIRE, Waterford, Ont.

First Vice-President:—K. W. MCKAY, St. Thomas, Ont.

Second Vice-President:—C. R. WHEELOCK, Dufferin County, Ont.

Secretary-Treasurer:—GEO. S. HENRY, M.P.P., Todmorden, Ont.

Directors:—W. H. PUGSLEY, York County, Ont.; J. J. PARSONS, Haldimand County, Ont.; MAJOR KENNEDY, Peel County, Ont.; T. E. ALLEN, Hastings County, Ont.; F. A. SENECAL, Prescott County, Ont.; J. MCLEOD, Leeds County, Ont.

All of which is respectfully submitted.

I move, seconded by Mr. Parsons, the adoption of the report. (Carried.)

REPORT OF COMMITTEE ON RESOLUTIONS.

(Ontario Good Roads Association.)

The Committee on Resolutions beg to report as follows:

1. That the thanks of this Association be extended to the President and Officers of the University of Toronto for extending to the Association the use of Convocation Hall.

2. That it is the desire of this Association to express its sincere regret that Mr. McLean, through illness, is prevented from presiding at this Convention, and that a copy of this resolution be forwarded to Mr. McLean.

3. That this Association desires to express its hearty appreciation of the large attendance of delegates from outside the Province of Ontario, including especially those from the Province of Quebec and from the United States, and that the thanks of this Association be tendered to them for the valuable services they have rendered the Association by their presence.

4. That this Association also desires to place on record its appreciation of the work of Mr. G. A. McNamee, the Secretary of this, the Second Canadian and International Good Roads Congress, whose efforts have so well contributed to the success of this Convention.

5. That this Convention approves of the recommendations contained in the Report of the Provincial Highway Commission, and that in the opinion of this Convention the interests of the Good Roads movement in Ontario demand an early declaration of the Government's policy in reference to the construction and maintenance of County Roads.

6. That in the opinion of this Convention the construction of special highways suggested in different parts of the Province should not be undertaken until the future policy of the Government for road improvement is determined.

7. That in the opinion of this Convention, owing to the great educative value contained in the addresses, papers and discussions presented at this Convention to those interested in Good Roads, the Provincial Government be requested to print the complete proceedings of this Convention for public distribution at as early a date as possible.

LUIUS E. ALLEN,
Secretary, Committee on Resolutions.

Moved by Mr. Senecal, seconded by Mr. Allen, that the report of the Resolutions Committee be adopted. (Carried.)

MR. BEAM: I would like to ask how wide the report of this Convention will be circulated, and I would move that it be not only circulated among the municipalities, but to the members of the Farmers' Institutes, the Fruit Growers' Association and Farmers' Club.

MR. PUGSLEY: It has been the custom to have a number printed, and a copy sent to every delegate. I do not know how far we can go or whether we can go any further than that.

MR. SANDERSON: The Government assists us in printing these minutes. There are a great many thousand people on the mailing list. I know the report is very

widely circulated, and I feel sure that every facility for distribution will be taken by the Government.

As the meeting is about to come to a close, I desire to thank the members of the Ontario Good Roads Association for their kindness to me during the past year, in which I have had the honour of being their President. The Executive have been very kind indeed. I have not done as much as I might have done, but I have tried to do the best I could. I can say to the members of the Ontario Good Roads Association that, in the selection you have made to-day, you have a man for President who is thoroughly capable, a man whose heart and soul is bound up in the Good Roads movement of this Province, a man who, in years past, has given his time and attention to the advancement of Good Roads and legislation, and has done everything he could for the betterment of the roads in the Province of Ontario. I am sure that during the coming year we may look for great advancement. It gives me great pleasure to introduce to you your new president, Mr. S. L. Squire, and I will ask him to take the chair at this time.

PRESIDENT'S ADDRESS.

S. L. Squire, Esq., Waterford, Ontario.

I am sure, Gentlemen of the Convention, that it gives me a great deal of pleasure to accept the position of President of the Ontario Good Roads Association. Being a modest man, the kind introduction given by the retiring President has placed me in the position that I really do not know what I should say. He has apologized for the mistakes he may have made, and I expect we will make mistakes during the coming year, but I am not going to apologize on that account, because I take it that the only people who do not make mistakes are the dead ones, and I trust that the Ontario Good Roads Association is far from being dead. I should enter upon this work with fear and trembling if it were not for the fact that I know that there are men on the Executive who are capable of advising, and whose hearts are in this proposition.

After having listened for the last three or four days to the splendid addresses that have been given to us, we all feel the importance of the undertaking in which we are engaged. Some may think that the building of roads is as old as civilization, but after listening to what has been said during this Convention, the thought comes to me that we are just at the beginning of a new era, and the things which are not known about Good Roads will fill more books in the future than in the past. I trust that we will find a great deal of profit in considering the report of this meeting, and I am sure you will all go home greatly benefited by the addresses that have been delivered.

We will promise you only one thing, and that is, with the limited ability that we have, we will do our best to serve you. I realize that in the honour you have conferred upon me, you have made me the servant of every road-builder in the Province of Ontario. (Applause.)

I would like to say in confirmation of what the retiring President has said, in relation to our joint meeting here, of the Dominion Good Roads Association, under the auspices of the Ontario Good Roads Association, two in one. Some

people have been unkind enough to say that two families cannot live at peace in the same household, but I am sure that these two Associations have enough in common so that we can live forever together without seriously interfering with each other's comforts.

Again thanking you for the honour you have conferred upon me, and trusting that this year may be a profitable one for the Good Roads of Ontario, I will declare this meeting adjourned. (Applause.)

EIGHTH SESSION.

Friday Morning, March 26th, 1915.

J. A. Sanderson, Esq., Vice-President, in the Chair.

"BITUMINOUS CONSTRUCTION."

J. Pearson, Esq., President of the Constructing and Paving Company, Toronto.

In dealing with a matter covering so much ground as the nature and use of bitumen in the construction of roadways and pavements and the various methods of construction, one can only in a paper of this length touch upon the subject here and there. I will, therefore, have to confine myself to directing your attention to only some of the leading facts and features relating to the material in question, and the methods adopted in making use of it in road-making as may be of general interest, and particularly to the road-builder, gathered from a practical experience extending over twenty-five years, for it is twenty-five years ago since the company that I am President of was organized, and it has been ever since actively engaged in laying asphalt pavements in the City of Toronto. In fact, it has constructed over one-third of the total asphalt pavements that have been laid in this city.

There are many varieties of hydro-carbons known by the name of bitumen, but for our purpose we will only refer to those used in the construction of roadways and pavements. These may be divided into two classes, coal tar or paving pitch and asphaltum or asphalt. Coal tar was used extensively some years ago as a filler for macadam roadways known as tar-macadam. These pavements were fairly good pavements for a time, when properly constructed, but the short life of the tar, being only from four to six years, and the difficulty in repairing or renewing them, together with the reduction in the price of asphalt, so much superior and more durable, has led to the almost disuse of coal tar as a paving material except when used as filler in grouting block pavements.

There is then left to consider the all important and extensively used paving bitumen called asphalt. There are now many kinds and grades of asphalt in use, but it is still true that there are no two asphalts just alike. Thus you will therefore understand how necessary it is to have a practical knowledge of all these varieties of material to be an up-to-date and efficient road-builder, whether engineer or contractor, to produce the best results in bituminous construction. The numerous failures of the past, where not only the pavements but the concerns that constructed them went out of business, is proof of the knowledge, skill and experience necessary in the selection of the proper materials and the treatment and manipulation of them necessary to produce the best possible results.

The discovery of the utility of asphaltum in road-making was accidental. It was observed that certain rock in the districts of Neuchatel and Val de Travers, in Switzerland, permeated with asphaltum, which had been broken and used in the roadways, wore down and, instead of the pulverized particles blowing away, as in the case of ordinary macadam, rolled out under the traffic and heat of the sun into a smooth resilient wearing surface. This use of bituminous rock having been discovered, it became extensively used in many of the cities and towns of

Central Europe and even to some extent in the United States and Canada. Several pavements of it were laid in Montreal and Ottawa.

The method of constructing these natural rock asphalt pavements consisted in pulverizing the rock, then heating and spreading the hot material to the desired depth on the street and pounding it with hot tamping irons. As it cooled it cohered and the traffic helped to solidify it. These pavements, when made from rock permeated with the proper quantity of bitumen, were of excellent quality and long durability, although somewhat slippery owing to the fine grain of the rock, which was a limestone. But as all the rock was not equally permeated with bitumen, some of these pavements were not a success, owing to a careless or incompetent selection of the rock. It was a very costly pavement on this side of the Atlantic owing to the heavy freight rates in carrying the whole wearing surface so far. This militated against its use in the United States and Canada, where it came in competition with the cheaper pavements made from the American asphalts in such general use here, to which I will now refer.

Observing the function that the bitumen performed in cementing or holding together the pulverized particles of rock led to the experiment of using the bitumen found in the Island of Trinidad known as Trinidad Pitch Lake Asphalt, with a fine sand as a wearing surface, and one Professor E. J. Smedt, a Belgian chemist, laid the first such pavement in Newark, N.J., in 1870. Later on, in 1876, the Roadway Commission appointed by Congress to select the best pavement for Pennsylvania Avenue in Washington, out of forty-one proposals of various kinds of pavements, selected Neuchatel rock asphalt and Smedt's artificial Trinidad mixture, two-thirds of the street being paved with the former, and one-third with the latter. When this street required repaving in 1889, the entire avenue was relaid with Trinidad sheet asphalt and soon afterwards the whole City of Washington was practically paved with it. In 1888 the first of such pavements in Canada was laid on Bay Street by the firm of Warren Schorff, and afterwards Jarvis and other streets were paved by them.

Trinidad asphalt, of which there were two brands, one called Pitch Lake, the other Land, both being in reality of one origin, was the only asphalt in use in Canada and the United States until 1892, when Bermudez asphalt from Venezuela was brought into the United States, a somewhat similar asphalt to Pitch Lake but much purer and more liquid, but both requiring fluxing with oil to reduce them to a degree of penetration suitable for use. There was practically a monoply of the Trinidad Pitch Lake Asphalt, and the Bermudez material got into the same hands, so that the monoply with a corresponding high cost of the pavement existed until the introduction of California asphalt in 1895. The first California asphalt was a hard natural asphalt, known as Alcatraz. About this time large deposits of liquid asphalt were found in Southern California, and subsequently similar large deposits in the State of Texas and in Mexico, so that we have now not only a great variety of asphalts to select from but by competition the price has been reduced until it is now about one-half the cost of what the Trinidad and Bermudez asphalts were under the monoply. In the last tendering for the City of Toronto supply for 1915 there were ten bids, each bidder claiming some superior qualities over the others, varying in price from $18.99 per ton f.o.b. Toronto, down to $16.50, and as low as $13.50 in tank cars, although there were no bids from Trinidad or Bermudez.

As I said, there are many asphalts and still no two just alike, that is, possessed of all the same qualities. Some are more susceptible to the influences of heat

and cold than others. Some possess greater cohesiveness and ductibility than others. Pavements made from some of these asphalts dry or weather out and become hard and rigid, crack and disintegrate sooner than others. It is, therefore, of the utmost importance in the use of these varying materials to have an extensive knowledge of them, so as to know how to obtain the best results, and this knowledge can only be acquired by practical experience in their use.

In the construction of bituminous pavements, the function performed by the bitumen is that of cementing or holding together in a solid body the mineral matter, which forms the wearing surface of the pavement, composed of sand, gravel or broken stone or a mixture of them. The bitumen of itself performs a minor part in the wearing quality of the pavement. In the early construction of artificial sheet asphalt pavements, which were composed of sand and asphalt in the proportions of from 10 to 15 per cent. asphalt to from 85 to 90 per cent. sand and limestone dust, it was thought that the finer the sand the better it was for this use, approaching as closely as possible the qualities of the pulverized limestone existing in the rock asphalt. But subsequent experience discovered that the best mixture for a good wearing surface was one of graded sand, from the finest to the coarsest, and so proportioned as to contain the least possible aggregate of voids, the coarser materials also aiding in and facilitating the process of mixing and making a wearing surface less liable to creep or become uneven under traffic in warm weather. In regard to this, Trinidad was a very difficult asphalt to handle; yet good results were obtainable.

It was also found by experience that, when applying the asphalt to such a graded mixture of sand and limestone dust, only filling the voids with asphalt to a proper degree of penetration produced better results than by putting in an additional quantity. It was also found by experiment that the wearing qualities of the sheet asphalt surface were improved by the addition of a quantity of small broken good hard stone or fine gravel. Continuing along this line we arrived at what we are now laying so much of, with such good results, a pavement composed entirely of small broken stone graded from one inch in diameter down to the smallest particles, and cemented together with asphalt, which we call "asphalt macadam," so that we now have developed through all the intermediary processes the two distinct classes of bituminous pavements known as Sheet Asphalt and Asphalt Macadam.

In speaking of asphalt pavements we only refer to the wearing surfaces, but all bituminous wearing surfaces must have a rigid base, either concrete or well rolled broken stone. Any vibration in the base is detrimental to the life of the pavement—hence, for example, the frequent repairs necessary along the vibrating rails of this city's ill constructed railway tracks.

And here let me say that an old solidified ordinary macadam makes a good base for an asphalt macadam. And if you want to see what an excellent pavement it is, just go over to Queen's Park and University Avenue and take a ride on it.

All asphalts are more or less soluble in water, Pitch Lake being the most soluble. Hence the use of a concrete or brick gutter for drainage purposes, and the necessity of a convexity of surface to the pavement.

In the construction of bituminous pavements great care and skill are necessary to get uniform and the best results. The mineral matter forming the wearing surface must be carefully selected, prepared and uniformly mixed and heated to a proper temperature. This done and the bitumen having been selected with

a full knowledge of its qualities, and carefully fluxed and heated to a proper temperature, the mixing process takes place and it also requires care and experience. Carelessness in feeding the asphaltic cement and limestone into the mixer will produce a defective pavement. Overheated sand will scorch the asphalt and destroy its cohesiveness. The material having been properly prepared and hauled to the street, the mechanical construction of the wearing surface also requires the exercise of care and skill. The raking is important. There never was a sheet asphalt pavement laid absolutely smooth and even, and the extent of the unevenness depends on the degree of carelessness or want of skill and experience in the raking and rolling. Then it must be borne in mind that, when asphalt is heated up to from 300 to 350 degrees, the oils evaporate and as these evaporate the penetration diminishes, so that there should be a continuous supply of fluxing oil to the mastic to make up for this diminution, particularly when the work is interrupted or let stand heated over night. This is necessary to get a uniformity of result.

When properly constructed a sheet asphalt is the nearest of all pavements to the ideal for residential streets in cities and towns. In fact it can, from its general adoption, be said to be the standard pavement for such streets. It is clean and can easily be kept clean and will then be non-slippery; it makes no dust, is smooth, durable, comparatively cheap and is at the same time pleasing to the eye.

But for leading country and State roads, the properly constructed modern asphalt macadam has no doubt worked its way to the front. There are two methods as to its construction, one when the material after being properly graded is mixed with the bitumen hot in a mixer, the same as in the case of sheet asphalt. The other is called the penetration system, when the wearing surface is prepared and spread on the roadway and the bitumen heated and poured over it. This process does not produce nearly as good results as the hot mixing, because the stone is cold and the bitumen does not penetrate and fill all the voids.

Up to the present time, of all the bitumen used in Canada none is the product of our own country, although our geological research and reports prove that we have more asphaltic bitumen such as is being used in paving than in all the rest of the world. It is to be hoped that Canadian enterprise will soon develop these resources, so that we will have our streets and highways paved with material entirely produced and made in Canada.

A Delegate: How long should asphalt be down in a pavement before it would require repair?

Mr. Pearson: If it is a good one and properly put down and has two or two and a half inches of wearing surface and the binder course of asphalt macadam, the wearing surface should wear right down to the binder course. If it is properly laid it should cohere to the binder course. If you lay a bad pavement it may require repairing in the next year. I am speaking of an asphalt that has been properly laid. An asphalt pavement was laid on Avenue Road twenty-one years ago. The surface at that time was only three inches deep and there are one and a half inches there yet. There is a tremendous traffic on that street. It has a street railway in the centre and there is only a narrow strip on each side for the vehicles. There is no material that will wear longer than asphalt if it is properly laid. It should wear until it is worn out. There is no definite answer that can be given to your question, because it all depends on the asphalt and the man who handles and superintends the laying of it.

A DELEGATE: Would you mind elaborating on the cause of the rolling or shoving of the asphalt? You spoke of the use of very fine sand causing it. Is there any other cause?

MR. PEARSON: Any asphalt pavement will shift if you make the penetration of the asphalt that holds it together too high. On the degree of the penetration depends the softness of your pavement when the sun shines upon it. This company, before I had to do with the operation of it, laid a pavement on Queen Street from Yonge to the Don, and they put too much asphalt in it. The north side of that pavement went wavy, until in places it got down to the concrete. The south side of the pavement remained in good shape and the people said, "Why didn't that company lay the same kind of pavement on both sides?" They did. This is what happened; Queen Street runs east and west and the sun shines on the north side of it most of the day. There is a heavy traffic of gravel and farm produce from the east and the teams keep to the right. All the heavy loads travel on the north side and, with the sun shining on that side of the pavement, it went to pieces. The empty wagons travelled on the south side. When you are laying a pavement you must take into consideration the conditions. On a street with shade trees on it you can make the asphalt many degrees softer than you would on a street that is exposed to the sun. I do not know of any business where you require so much care and thought in order to get the best results as you do in the use of asphalt.

A DELEGATE: Have you had any experience with the effect of frost on resurfacing a macadam road?

MR. PEARSON: Frost has no serious effect on asphalt itself, but you cannot lay concrete when there is frost. All the frost does to the asphalt when you are laying it is that makes it a little more inconvenient. You must hurry up the work and lay it and roll it before it gets chilled. You heat it in order to make it workable. Frost has no influence on the asphalt further than that it hardens it. You should lay your asphalt surface on top of the macadam in dry weather, because what you are endeavouring to do is to get the surface to stick to the macadam, and if you get the surface to stick to the base I do not think the frost will interfere with you unless you make your mastic a little too hard, and then it will have a tendency to crack, because a hard substance will contract with the frost.

A DELEGATE: You evidently know the Centre Road and you know that it has got rutty and wants repairing. The township fathers have an idea that we should merely put on some broken stone and roll it in. I would like to know what the expense would be of resurfacing that road with asphalt?

MR. PEARSON: I could not tell you off-hand. Knowing that road and how it was constructed, I would say that parts of it have not sufficient material to make a base for an asphalt surface. I think you would require to put on some additional material. The sides of that road were made too steep and the gravel has spread out too thin. A large part of that road is made of broken stone and gravel. When they put the gravel on the road they just simply dump it. They should have put a split-log drag on that and levelled it off. If they had done so, the road would have lasted twice as long. I am astonished that the people who make roads do not make more frequent use of the split-log drag.

A DELEGATE: What effect does it have on the asphalt surface if you allow teams to drive over the concrete base before putting the asphalt on?

MR. PEARSON: The City of Toronto has always undertaken to tell con-

tractors how to lay the concrete base. They do not make any provision for expansion joints: you are driven almost to the verge of making the surface soft and the base is apt to crack and this will crack the asphalt. If you go over a pavement like that, wherever you find a crack in the asphalt, you will find a crack in the concrete. Can you tell me how you can lay concrete without a crack, unless you anticipate the crack and make it yourself? And, if you have a concrete surface, how can you keep the crack from becoming a rut? If you take up the asphalt pavements in Toronto to-day, you will find the concrete cracked. At the present time we are putting on a binder course one and a half inches thick, and we put the wearing surface on top of that. That allows the concrete to contract and expand as the weather affects it, without deteriorating the surface.

MR. MACALLUM: There are one or two points in what Mr. Pearson says that should be elaborated on; first, as to asphalt macadam. The ordinary country road has a crown that is far too great for the asphalt, and, if you take off the crown to put on the asphalt surface, you practically take out the macadam base; but if you do not take it out the pavement is too slippery. The second point is as to making asphalt macadam from small stone and sand. You are apt to infringe on patent rights in doing that. We have used a pavement that came near infringing on these rights on residential streets, but it will not stand up for business streets. The third point I wish to refer to is penetration. With the climate of lower Ontario, if you make the penetration too high, you run the danger of rolling and calking up from the horses' hoofs. On the other hand, if you make it too low the pavement will crack, so that you have got to have either one or the other of these possibilities in mind.

One gentleman asked how long an asphalt pavement should last. The guarantee used to be for ten years. It is now being cut down to five years. In the City of Toronto alongside of the University Athletic Field an asphalt pavement was put down and only lasted about two years. The base is there without the asphalt.

A DELEGATE: Has urine any effect on asphalt pavements? I have sometimes heard that it has.

MR. PEARSON: I do not think it amounts to anything, because it runs off.

I mentioned sand in the mixture for the wearing surface, if you put in too much fine stuff, you may detract from the wearing quality of it. The wearing quality is the stone: the other stuff is merely to fill in the void. Where there is a large stone sticking out, the vehicle pounds on that and there will be a depression near it, and I think we sometimes put in too much large stone, and that is a mistake, because you must have an even surface. The only reason an asphalt pavement will last is the smooth surface. You have pressure and not pounding. Whenever you get pounding you will have wear. The granite-rock pavement in New York was pounded out of shape. With an asphalt pavement, you have a smooth surface and you get pressure. That is one reason why you have to keep repairing it. It is hardly worth while building these roadways unless you keep them repaired.

When I was speaking about macadam roadways I had not in mind the new macadam roadways with three or four inches of stone spread on the surface. I had in mind the old macadam roadways that they took up in Toronto when they introduced cedar-blocking.

A DELEGATE: I understood you to say that a macadam base would be better than a concrete base?

MR. PEARSON: No, sir, I say a concrete base is much better than a macadam base, but a concrete base is more expensive. You could hardly afford, in the country, to make a concrete base and put an asphalt surface on it. I think concrete is the ideal base for any wearing surfaces.

A DELEGATE: You said concrete is apt to crack?

MR. PEARSON: If you make the top surface as we are making them now, the crack will not come through.

A DELEGATE: I come from a city where we have had a lot of trouble with the asphalt rolling. What would be the effect of laying the concrete and letting it get hard, and then not following up with your asphalt at once, but allowing teams to drive over it before you put on the asphalt.

MR. PEARSON: The asphalt should not be put on until the concrete has thoroughly set.

A DELEGATE: If it is properly set and you do not then follow right up with the asphalt, would the creation of a dust surface between the asphalt and the concrete be detrimental to the pavement?

MR. PEARSON: With the binder course that we put on now, I do not think you will have any trouble. If you put in a little broken stone with the sand it will be all the better and you can use a very soft mastic, and your pavement will solidify.

A DELEGATE: What does the bitumen in the binder course consist of?

MR. PEARSON: Just the same as the surface. You use the same material for the binder course.

A DELEGATE: Do you believe a bituminous binder without tar is better than with it?

MR. PEARSON: Tar cannot compare in quality with asphalt.

A DELEGATE: The point I want to make is the effect of its binding with the concrete.

MR. PEARSON: The asphalt is a much stronger binder than tar. Tar will run in the summer-time and contract in the winter, and it will only last for five or six years. I would not recommend the use of tar in an up-to-date pavement. We use it now in the cracks between blocks, but I do not think it should be used even there, when we can get asphalt for $13.50 a ton in Toronto. When you have the asphalt in your kettle heated up to 300 or 350 degrees, there is an evaporation of oil and the longer it is in the kettle the less will become the penetration because you are losing your oil. If your work is interfered with at any time you must put in some asphaltic oil, in order to get that substance back again. I would not want to be interested in an asphalt company unless they had a man who understood these things on the job day and night.

"CONCRETE ROADS AND STREETS."

H. S. Van Scoyoc, Esq., Chief Engineer, Toronto-Hamilton Highway Commission.

The use of concrete as a paving material is fast passing the experimental stage. Although it is doubtful if there is as yet sufficient information at hand to permit of a close approximation as to the life of concrete pavements under varying conditions of traffic, soil and climate, there are particular cases of record showing the economy of this type of pavement after periods of actual use ranging from five years to ten years.

There are at least a few streets to-day in good condition after twenty years of service, which would seem to show that, if there were failures in the earlier work, they could likely be traced to the same causes that will produce failures now. It is a fact, however, that there was more reason for attempting mixtures weak in cement then, for a barrel of cement cost from three to four times as much as now. In addition, the remarkable increase in motor traffic during the last ten years has made it much more difficult to maintain those types of paving in which the various separate units are not held together by a positive binder, as is the case with concrete. It has also greatly increased the life of concrete or similar surfaces because of the decrease in wear from rubber-tired vehicles as compared with that from horse-drawn, steel-tired traffic.

If it is granted that there must be some merit in a paving material, the total yardage of which in Canada and the United States increased in 1913 from 9,000,000 square yards to 18,000,000 square yards and of which 16,000,000 square yards were laid during 1914, it ought to be worth while to note some of the facts that have been established by experience more particularly during the last five years.

Subgrade.

The fundamentals in road-building hold good for concrete just as for the other types. A system of drainage must be provided which will keep the water-level well below the subgrade. This is especially true where frost has to be contended with. Where the natural soil is heavy clay or other material that is not self-draining, there are certain advantages in placing the concrete upon several inches of gravel or other pervious material. If surface water does get beneath the concrete, it then has a better opportunity to get away. In addition, especially in hot, dry climates, there will be no trouble from cracks developing in the concrete slab due to the drying out and cracking of the sub-base material. This may occur when the concrete is laid directly on the natural soil. The subgrade should be constructed with the idea of having it evenly compacted for the full width of the road section. This means special care where the concrete is replacing a highly crowned macadam road which was likely also not of as great a width as the new road will be. No doubt the bearing power of the soil can be greatly increased by careful rolling with a heavy roller, and this is certainly very desirable, but it is of at least equal importance that all parts be evenly compacted.

In order that the greatest thickness of concrete shall come where it is most needed, the subgrade should be flat up to a width of roadway that does not increase the thickness of the concrete slab at the centre unreasonably. With the crown usually given concrete roadways (1-100 of the width) the limiting width would be about twenty feet. Beyond this width the subgrade should be slightly crowned so that the thickness of the concrete at the centre will remain constant.

Materials.

There is some difference of opinion as to whether it is the mortar composed of the fine aggregate and cement or whether it is the coarse gravel or broken stone that has to resist the wear on the road surface. It seems reasonable to suppose that both contentions may be right—that is, if a uniformly tough, hard, fine aggregate is used with a comparatively soft coarse aggregate, the mortar may take the wear; while, with reverse conditions, the wear may come on the coarse materials. With ideal materials, both fine and coarse aggregates should be tough and *uniformly* tough, for it seems almost axiomatic that, if construction is properly carried out, the life of the pavement will depend directly upon the quantity and character of the traffic and the wear-resisting qualities of the aggregates. Materials that show uniform wear are certainly to be preferred over those containing some very tough and some very soft particles.

It is a mistake to use any material as a fine aggregate which has not been actually mixed with cement and made up into test pieces and compared in strength with the results secured from the same cement and standard sand. In more than one instance, sands which to the eye have appeared fairly good show absolutely no strength even in long time periods. Needless to say the cement should be of known good quality, but it should not be expected to make up the deficiencies of the other materials, which even in concrete for road work comprise a bulk about five times that of the cement.

Proportioning.

While the proportions may be varied slightly, according to the nature of the aggregates used in most of the work now being undertaken, a mixture of about one part of cement to one and one-half parts of fine aggregate to three parts of coarse aggregate is specified. It seems strange that in road work there have been so few attempts made to get away from wheel-barrow or bottomless box proportioning. It is one part of the work in which less progress has been made than in most of the others. There have been some exceptions, notably one road in Oregon, where the proportioning was done by bins at a central plant and three charges for the drum of the mixer carried in each car of the industrial railway train that was used to convey the material to the road. On one of the Maryland roads small dump cars were used in connection with a narrow-gauge track. Partitions were placed in the cars, so that one side of the car held exactly one charge of cement and fine aggregate and the other side the right quantity of coarse aggregate. Each car in this case thus held the material for one batch. Both schemes have been reported as satisfactory.

Mixing.

There has been wide variation in practice as to the time and speed required for mixing, but it is now realized that the number of revolutions per minute of the drum may vary with the type of mixer, the size of the drum and the nature of the mixture. For satisfactory results it is usually necessary to keep the batch in the drum for at least one minute. It is very desirable that a uniform mixture be secured. The concrete should be of such a consistency that it will stand without flowing when deposited. It should not be sloppy, but it should be wet enough to settle in place with the tamping that it receives from the strike-board.

Finishing.

When the width of the road or street is not greater than eighteen feet, the proper shape can be given the concrete by means of a strike-board or template cut to the desired crown. It rests on the side forms, and is worked slowly up and down and at the same time slowly forward by a man at either end. If the surface is to be true, the side forms must be carefully set to line and grade. Any imperfections here will be reproduced on the road surface. For wider streets a more satisfactory surface is usually secured by driving stakes to the proper grade at intervals of say four feet and having the finishers work to the tops of them, removing them of course when they have served their purpose. In any case the surface should be finished with a wooden float before the concrete has set up. The finishers should remove any little depressions or high spots that may exist and should leave a surface that is even but not smooth.

Joints.

Transverse joints are now usually spaced at about thirty-five feet intervals, although the spacing varies considerably with above and below this figure. The joints need not be wide, but are preferably filled with a bituminous felt that will accommodate itself to the changes in length of the slab with varying temperatures and moisture content. They should be waterproof and should be so placed that there will be no unevenness in the surface of the road at that point. In no other part of the construction will lack of careful workmanship be so evident as at the joints. There has been some tendency to reduce the joint thickness at the time of construction to 1/16 of an inch or less and provide no joint filler. There is an element of danger in this method, where the ranges of temperature are as great as they are in this climate. In one case, where cross joints were widely spaced, joints that were tight during construction opened fully ⅜ of an inch the following spring due to contraction during the winter. Water could enter under these conditions and cause serious trouble. Joints are now usually made at right angles to the centre line of the road, although in some cases they have been placed diagonally across it. In any event, they should be made vertical, as there have been some instances where slabs have been forced upwards when both faces were not perpendicular.

Protection.

If there is wind or strong sun, the surface should be covered with tarpaulins just as soon as they can be placed without marking the concrete. When the concrete is about twenty-four hours old, this covering should be replaced by about two inches of sand or soft earth. The concrete should be sprinkled just as soon as it will stand it without marking and should be kept damp for at least ten days. Large quantities of water are required for concrete road construction, for the subgrade should be well moistened before the concrete is placed and, in addition to the water required for mixing, there should be other supply for sprinkling. It has been said that a year of serviceable life is added to a road for every day that traffic is kept off it. When possible no traffic should be permitted for at least three weeks and if the weather is cold and damp this period must be increased.

Two-Course Work.

It is a mistake to say that satisfactory two-course pavements cannot be laid. Many examples could be cited to disprove the statement. There are several disquieting factors introduced, however, with this type of construction. If the

top course is not deposited almost immediately after the bottom course, there is danger that the two courses will not unite properly. Usually the top course is much richer than the bottom. This is undesirable for two reasons. In the first place, the expansion and contraction of the concrete vary with the strength of the mixture. Again, the expansion and contraction vary with the moisture content. The moisture content will likely be greater in the bottom course, because it will usually take up some moisture from the subgrade, while the top course will be practically waterproof. In either of these cases there must be unequal movement of the two courses. However, where local materials are poor in quality and economy is necessary, there is a justification for using the cheap local materials for the bottom course and bringing from a distance materials of suitable quality for the top course.

Reinforcing.

No concrete road or street will be injured by the addition of reinforcing. It is almost certain, however, that all cracks of such a width as to be visible to the eye will not be prevented by the addition of the weight of reinforcing usually specified for concrete roadways. Where subsoil conditions are bad, due either to the nature of the material or to the openings that may have been made for pipe lines, there is value in reinforcing. Where the appearance of a road or street is of major importance, reinforcing should be used. It is a question, however, if it has as yet been shown that reinforcing is economically justified for the usual widths of country roads, where an occasional crack cannot be considered a serious fault.

Maintenance.

It has been said that the justification for the use of concrete lies in the low maintenance costs. With proper materials and workmanship, the annual charge for repairs to the concrete surface should be small. There may be some surface pitting; there may be some cracks requiring attention; there likely will be some joints to be taken care of; on country roads there certainly will be shoulders to maintain and ditches to keep open. Undoubtedly some provision should be made for the maintenance of even a concrete road.

Costs.

Naturally, the cost of the roadway proper will depend upon the cost of the cement, fine aggregate and coarse aggregate on the road and the labour cost for combining them properly and placing them in the road. The material costs will vary greatly with the distances they must be hauled. The labour costs will depend to some extent upon the organization. In rare instances, where conditions are particularly favourable, the cost per square yard may be as low as $1.00. Usually the cost should be below $1.50. An average price in this vicinity will likely be in the neighborhood of $1.35.

In conclusion, there is to my mind an analogy in concrete road building and the statement in mechanics that the work taken out of a machine cannot exceed the work put into it. In other words, if a satisfactory road is to be built, there must be a constant effort to secure the highest possible grade of concrete. Concrete is its own inspector. In concrete roadways, concrete has its most severe test. The material is equal to the test, but it is at the mercy of the user.

MR. BEAM: How thick would the concrete pavement be, that you could lay at $1.35 to $1.50 per yard?

MR. VAN SCOYOC: About six inches—that is, of course, exclusive of the cost of reinforcing or protection plates. I am speaking of the concrete itself. We have certain materials which will vary in their cost, according to the distance they have to be hauled.

MR. BEAM: Would six inches of concrete be equal to nine inches of macadam in strength?

MR. VAN SCOYOC: I think it would. In any type of road there will be a certain amount of maintenance, if you want to keep the road in first-class condition. This maintenance must be done from year to year. In concrete roads there may be some cracking which will have to be taken care of. There also may be small spots that will chip out. There will be necessity for some maintenance as to joints. These things are not going to cost a large sum of money, and they will add a lot to the life of the pavement. There are records of concrete roads that have been kept in good condition at a cost not exceeding $50 a mile, and that is a very conservative figure as compared with the maintenance charge on many other roads that have been built. The kind of concrete road we get will depend largely on the materials we use.

A DELEGATE: On the Hamilton-Toronto road will it be all concrete or will it have a bituminous surface?

MR. VAN SCOYOC: There will be no bituminous surface on the Toronto-Hamilton highway.

A DELEGATE: It will be a good test as to what a concrete road will amount to?

MR. VAN SCOYOC: Yes, that is true.

A DELEGATE: How do you propose to repair joints when they get worn?

MR. VAN SCOYOC: My idea is to take a tar preparation with a little sand. My reasons for using tar rather than asphalt is that the adhesion between the concrete and the tar is greater than the adhesion between asphalt and concrete.

A DELEGATE: Would it be a dusty road? If you keep the traffic off it after it has been constructed, and if each day you keep the traffic off will add a year to its life, would not it be a good idea to keep the traffic off for one hundred days?

MR. VAN SCOYOC: I think it is certainly true that, if we could keep the traffic off forever, the road would last forever. (Laughter.)

PROF. LAING: It is a fact that we can reduce the voids in a given aggregate by compaction, in the first place, without the use of cement and water. What is your opinion of the use of that method, or what is sometimes known as the Hassam method? Would you recommend it for country roads?

MR. VAN SCOYOC: You certainly get a denser concrete. There can be no disputing that, but to my mind there is no advantage in stirring up the concrete when it is attempting to set. If the rolling is continued it would seriously interfere with the life of the concrete. I do not think we have any pavement that will last forever, especially where there is heavy traffic. The length of time a road will last will depend on the quantity of traffic. I am not afraid that the concrete will not stand the traffic.

A DELEGATE: It will deteriorate more rapidly under steel-tired traffic?

MR. VAN SCOYOC: Yes, there is no doubt about that.

A DELEGATE: The concrete would last a long time if motor tires only passed over it?

MR. VAN SCOYOC: Yes, it will depend on the thickness of the pavement. If you have a minimum wearing surface of six inches it is going to take a great many generations to wear it out, if it is constructed so that it will wear evenly.

A DELEGATE: I should like to ask your opinion as to the use of steel plates for the protection of joints.

MR. VAN SCOYOC: I think there is room for a difference of opinion in that matter. There is no doubt that the joints are the weakest part of a concrete road. It was felt some years ago, when the steel protection plate came out, that it had reduced that trouble considerably. To my mind, the steel plates used during the last few years have not been a perfect success. I think the trouble has been due largely to the materials that went into the steel, also to the fact that they were not placed properly in the road. If they are going to be of any value, they must wear down evenly with the concrete and they must be installed so that they will be exactly even with the surface. If they are above the surface, they will make a rough riding joint, and, if they are below the surface, they might as well not be there. If these objections can be cleared up, then I think they will be a valuable addition.

A DELEGATE: The speaker is probably familiar with the Windsor Station at Montreal. They have a most beautiful concrete platform where the trains come in. There is not a crack anywhere in these platforms, and yet there are no expansion joints. There is quite a long stretch of concrete. If expansion joints are not needed in a platform like that, why should they be needed in a road, if the road is not bound in on the sides? Would not the expansion be taken care of on the sides of the road? Are these expansion joints every thirty-five feet needed?

MR. VAN SCOYOC: Why the platform at the Windsor Station has not cracked, I do not know, but there is no doubt in my mind that cracks will come in the road if the joints are not left, for the simple reason that in the roads that have been built without expansion joints cracks have come.

A DELEGATE: Are not some of these cracks caused by shrinkage in the concrete?

MR. VAN SCOYOC: Yes, that is true. That is really the basis for the idea of making the joints just as narrow as possible. The shrinkage is supposed to take care of a change in temperature of about 100 degrees.

A DELEGATE: Theoretically speaking, is there any reason why that expansion should not be taken up across the road?

MR. VAN SCOYOC: Theoretically that may be true, but I am afraid you cannot get rid of this shrinkage, and we have to put the joints in to take care of that.

A DELEGATE: Is there any way of getting rid of that shrinkage in the concrete?

MR. VAN SCOYOC: There may be some way, but if it is known it is kept pretty quiet.

DISCUSSION.

FRANK CHAPPELL, ESQ., TOWN ENGINEER, OSHAWA, ONTARIO.

A paving fact and an important factor in road construction, which some people seem slow to grasp, is that no pavement is permanent. The term "permanent pavement" should not be taken as literally true, but only relatively so, for it is a common experience that all pavements commence to deteriorate from the time they are opened for traffic. Then again, we know very well that two similar pavements laid down under similar conditions will quite frequently show a decided

difference in endurance under traffic. The "personal equation" seems to enter as largely into pavement construction as anything else, in spite of carefully drawn specifications. Of no pavement is this more true than of cement concrete and, this being so, one should be carefully guided between the extremes and means—of the apparently perfect concrete road and the apparent failure shown by this pavement in some cases. The facts relating to the details of construction should be required at each observation, and here one may note that it is regretable in the interest of good pavements generally, that advertisers and pavement promoters should indulge in so much anonymous disparagement of any rival pavement without an abundance of facts.

Some time ago, in common probably with a number of other engineers, the writer received a little yellow covered anonymous booklet, entitled "The Good Road, and the Not So Good." This endeavoured to show, and no doubt proved to the satisfaction of the author, the crass stupidity of some municipalities in laying concrete roads. There may have been some points of merit within the covers of the pamphlet, but unfortunately they were lost sight of when one noticed on closer observation the bar sinister, as it were, against the book in the fact that no one acknowledged its parentage, there being not even a printer's name. There is no doubt, however, that it was calculated to inspire apprehension in the minds of those who had committed themselves to concrete pavements, and in some cases probably had that effect. A nearby municipality, for example, had already started on the work of paving when one of these yellow enveloped Zeppelins came within the view of a lay member of the council. Such an effect was made by this apparition that some of the members seriously discussed whether it would not be wise to stop the work at once. However, other counsel prevailed and the work went on, the pavement went down and it is there yet, and shows every likelihood of staying where it was put.

The first piece of road built in Oshawa was an eight inch macadam, on a telford base. This was estimated to cost 95 cents per square yard, and the actual cost by day labour was $1.01. It was well made and, apart from the fact that it was alternately muddy and dusty and harboured dirt, it was in fair shape after two years. It then commenced to unravel, and had it been deemed policy to maintain it, it should have been repaired at once, a circumstance with which we are all more or less familiar. In the meantime, however, tenders had been called for an extension of this class of roadway, it being thought that the work would be done cheaper by contractors than by day labour. We are all familiar with the opinion of worthy citizens who imagine that day labour by a corporation is robbery, forgetting that not infrequently contract labour by a careless contractor is jobbery. The prices received in these tenders for macadam ranged from 95 cents to $1.16 per square yard, the main reason for such prices being that broken stone had to be brought by rail at a cost of approximately $1.50 per cubic yard.

In the face of these tenders it was decided that macadam roads, with the consequent liability for maintenance, would not be a satisfactory form of surface for main streets in a busy town. Different high class types of permanent pavement were later adopted for the leading thoroughfares at prices ranging about $2.50 per square yard. These pavements, while giving great satisfaction, cannot be continued to any great extent past property with scattered frontage, or on streets where property would not receive so high a valuation. To meet these conditions, a plain concrete pavement was put down. It is believed that this was the first of its kind laid east of Toronto and, as it is on the Kingston Road, it is already doing its part as a link in the highway of which we hear so much that is to connect

Toronto with Montreal. This pavement being the first, and moreover being laid by contractors who had never before laid a pavement of any kind, has not the pink of perfection appearance that so many pavements exhibit on first acquaintance. It has defects which are interesting inasmuch as in the future they will be guarded against, but to the general public who use the road it is by common consent a sound piece of work. To confess some of these faults (for the errors are ever before the writer) it may be said that the surface is rather wavy, due to inexpert finishing, and the joints are not as regular as they might be. Impurities in the gravel, combined with the *laitance* from the cement at first gave a scaly, blistered appearance which, however, disappeared after a while. Now the concrete pavement was laid down at $1.12 per square yard, including excavation, and gives all the comfort and ease of traction which may be expected from a permanent pavement. Moreover, its state of cleanliness is surprising, dirt and litter drifting to the uncurbed sides of the road, leaving a clean white ribbon of concrete twenty feet wide, extending for more than half a mile into the country.

The following year, two similar pavements were put down; and here a point should be noted, that Oshawa has not been advised to go on headlong with concrete roads simply as a fad and because they are concrete. There is another reason. The comparisons of cost between macadam and concrete have already been shown. Another point is that the macadam pavement was paid for by the town in cold cash from current revenue without any direct tax against the adjacent property. This was the cause of much bickering and jealousy expressed by the residents of other streets in the municipality. For the concrete pavements, however, debentures were floated, and the pavement is paid for by the owners of property fronting on the work, in payments extending over twenty years in the proportion of 60 per cent. payable by the property owners and 40 per cent. by the town. Thus you are able to put a proposition to the property owners on behalf of a pavement in this manner, "Will you, Mr. Property Owner, pay a tax of from six to eight cents per foot per year for a pavement passing your property?"

That is what the most expensive of our concrete pavements cost the property owner and, compared with the advantages received, it must be conceded that the sum seems trifling. So you see it is not the fad concrete, but the practical dollars and cents point at issue, that is considered. The only sound way for a town to finance its paving is on the frontage basis, and the period over which payments are extended should not exceed a conservative estimate of the life-time of the pavement; and of course local traffic conditions would govern this. Then again all citizens use the main thoroughfares more or less, and so it would seem fair that all should contribute some portion of the cost, as has been illustrated, say 40 per cent. by the town at large and the remaining 60 per cent. by the owners of adjacent property. Once off the main thoroughfare, however, the cost should be borne wholly by the property owner and, as has been shown, it is no very great amount in the case of such a pavement as we are discussing.

Now regarding the technical side of the concrete pavement, too much care cannot be given to the selection of an inspector. It is a slow process, but each year some town or other is looking over its previous year's work with regret and realizing that the $2.00-a-day, old, and esteemed citizen who was put on as inspector was, after all, a poor investment. Good intentions and an honest conscience are all very well but, for the sake of the pavement in a municipality, it must be good common sense and an honest understanding, based upon a practical experience of the work in hand. Three or four per cent. of the cost of the piece of pavement is little enough to pay for competent supervision, but it can be done

for that. The aggregate and cement are more or less staple, but the "personal equation" rests with the competence of the inspector who is to have charge of the work.

So much information in the nature of specifications is common knowledge that only a few details of a practical nature that have arisen during the course of pavement work will be touched upon here. In Oshawa, the aggregate has been supplied by creek, pit, and lake shore gravel. In the first road the stone was separated from the sand by screening and then picked over, and stones larger than one's first were removed. Where the subgrade had been excavated below grade, the larger stones were pounded into the roadbed just ahead of the concrete. This plan, however, leads to confusion and is not to be recommended. On other streets the gravel was screened as far as possible between the limits 2 inches to ¼ inch. A point worthy of notice is to take care, after the ingredients have been separated, that teams and workmen bringing up fresh material along the subgrade do not raise a dust that will most surely coat the surface of the stones and the heaps of sand ahead of the mixing outfit. Simple as it seems, this has been a source of serious defects.

It seems to be more sound practice to have the subgrade flat and, assuming the road to be sixteen feet wide, to have the middle of the cross section seven inches thick and five inches at the side, than to have a uniformly crowned road surface six inches thick. The only danger with the flat subgrade is that, unless great care is taken, it is likely to be hollow in the centre in some places and so of course offer facilities for the retention of water. Close attention should be paid to rolling, particularly where any filling has been carried out. If the filling is much over six inches, there is no doubt that greater security is offered by the adoption of some reinforcing material. Wire mesh is suitable and very convenient for this purpose, although of course adding somewhat to the cost of the finished pavement.

The Oshawa work has been carried out with a mixture having the proportion of 1: 2: 4, and with thorough mixing seems to give good results, although some authorities advise a proportion of 1: 2: 3, and even stronger proportions. A thorough mixing, however, covers a slight error in the amount of cement, and to check this the number of revolutions of the mixer per batch should be frequently noted, and the contractor cautioned if necessary against "racing" the gang to finish out ahead of a previous day's work.

As a suggestion which would perhaps offer a wider field for discussion than is confined within the limits of this talk, the writer would call attention to the possibilities of a new line of development in concrete road work. The application of concrete with an air compressor has been successfully carried out upon building operations. Attention has recently been called to an article in one of our journals on the application of concrete to walls and such structures by high pressure, superheated steam. There is here possibly a wide field of endeavour and a new method of work offered some enterprising contractor with capital, in applying these principles of operation to pavement work. The aggregate must be uniform, a necessary quality in the pavement; the velocity at the point of application is a method of tamping, and so provides a uniformly dense mass; and, further, the material being treated by so much steam heat, crystallizes more rapidly, these three resultant factors alone being all important in the construction of our cement pavement. It may be that such a method is patent and if so an apology is due this meeting for introducing such a matter, but the idea seemed to be new and to have considerable merit.

The cement is getting to be more and more standard but since, to meet the needs of storage or to expedite shipment, manufacturers find it necessary to vary the proportion of the several constituents, it is equally necessary for the cement user to carry out careful tests of this article. Personally, the writer is of the opinion that for this work cement should undergo special tests showing its peculiar fitness for pavement work. Concrete in bulk is self-curing in time. Most other cement work is cared for in some particular manner that insures at least the commencement of a process of crystallization before using. The cement pavement which naturally has to endure severe shocks should receive particular care as to its setting and hardening qualities. Let this most important ingredient be tested at the mills by an independent inspector. The fee for such work is not a heavy one and the system is well worth while. The results of the 24-hour test will generally arrive at the work before the car, and so a guide as to the setting qualities of the cement is provided without holding up the job. Apart from the inconvenience and loss of time, if the cement is tested on the work and does not come up to requirements, dissensions are sure to arise as to what particular sacks of cement belong to the defective car load, and later there is always a chance of some of this creeping into service when supplies of cement run low.

Be sure that all finishing is done from a bridge or some temporary superstructure placed clear over the concrete. It has been stated that the only way to keep men out of the concrete is with a stick, and indeed it does seem to require drastic measures. The evil of such traffic in the concrete is made apparent upon close observation. The subgrade must be kept well wet ahead of the work. Carts and wheel-barrows carrying the concrete make a mud puddle of this, and then finishers or those who place the material churn this mud up into the mixture when they are allowed to stand in same. This matter, apparently as simple a one as the dust on the stone and sand before mentioned, nullifies all efforts to provide clean materials.

The finisher should be working all the time within thirty or forty feet of the mixing gang; otherwise initial set of the surface may take place, or dust will settle and prevent adhesion of the surface particles after finishing. A finisher should not be allowed to just smear a float over the surface of the concrete after the fashion of a house plasterer, but should exert a reasonable pressure and so close all voids in the concrete, smoothing the surface over afterwards to obtain the desired finish. This is particularly important on each side of a joint.

Joints are the bugbear of all concrete pavements. They are a necessary evil, and so there are innumerable patent devices on the market, some of which have much to commend them. However, in the Oshawa work only two thicknesses of tar-paper were used, these being first placed next a steel partition plate, the soft concrete being closed on the paper after removal of the plate. Of the resulting joints it can only be said that some are very good, while others show that greater caution might have been exercised while withdrawing the partition plate or while floating the surface after the concrete had been placed.

When a pavement is being laid by day labour, no effort is spared by the staff having the work in hand to show a commendable piece of work. Perhaps this is the reason for the criticism so often levelled at day work, the pains taken being considered evidence of wasteful work by some. Now, however rigidly a specification may be drawn, there is generally some point not wholly adapted to the work in hand. The engineer, or the inspector after a conference with the engineer, should be allowed a certain degree of latitude in the adjustment of specifications while the work is in progress, for it is better to check an apparent fault at the

moment of observation, than to continue the work with a defect that might have been eliminated.

Specifications should insist upon the provision of some satisfactory arrangement for keeping rain off the day's work. A succession of light trusses with canvas stretched between will shed the water and save much worry about rough pebbled surfaces, that it is impossible to make good and that induce wear from the first.

Any attempt to carry out concrete pavement work in winter cannot be too strongly deprecated. To all ingenious methods of heating ingredients, water, and so forth, the word "Don't" should be emphatically applied. The damage done by a succession of frosty nights is only too certain to upset all previous precautions, even if the days are warm. As a measure against attempting to carry such work through to completion against such chances as are offered with uncertain weather, all specifications should contain a clause stating that work must be completed, or else cease, by say November 1st. It is all very well to take a chance with work that can be confined to a certain small area but, for superficial work like concrete pavement, spread as it is over an extended area, proper protection against frost cannot be taken. The defects do not show at once, and regrets the next spring are useless.

Although the greatest defects in a concrete pavement are likely to show up within twelve months after construction, it is just as well to have a guarantee extending over a period of at least two years. This guarantee, to be of service to a municipality—and of course a fair guarantee is intended to strengthen the hands of the municipality—should be in the nature of cash held back out of money due to the contractor. If this amount is say 5 per cent. or 10 per cent. of the value of the contract, and interest at a rate to be agreed upon is paid to the contractor, an assurance is thus given that, if the work in question should prove defective, the municipality would be able to make good such defects out of the money they retained, without having recourse to law. It is very difficult to secure redress when holding guarantee bonds, even if they are couched in attractive terms and for apparently large sums of money.

DISCUSSION.

M. E. Brian, Esq., City Engineer, Windsor, Ontario.

Mr. Chairman and Gentlemen:

I believe Windsor is the pioneer city in the construction of concrete roadways in Canada, and you may have heard of concrete roadways being picked to pieces by reason of the defects in some of Windsor's streets.

The City of Windsor passed a by-law, covering twenty years, for the construction of macadam pavements, but these pavements became so dusty and muddy that they decided to put down some other kind of pavement. Twenty thousand yards of pavement were to be put down each year at a cost of about $1.00 a yard. Consequently, Mr. Haines, who was then City Engineer, had to get a pavement that would come within $1.00 a yard. The consequence was that the first pavements put down were on heavy traffic streets. We have a considerable number of factories in Walkerville. No doubt you have heard of Wyandotte Street. That is one of the streets on which there is very heavy traffic from the Canadian Bridge Works

and other big factories in Walkerville. The pavement was put down in that street in 1906; the mixture used was peculiar, going from 1 inch to 6 inches. The pavement cost $1.00 per yard, and last year it broke up. There is a street-car line on it and it was subject to the shock which always comes from a street-car line. Last year we repaired it with Dolway's bitumen. We also repaired Chatham Street and Park Street in the same way. The three streets cost us $2,700 and they made a first-class job of it. We have in the neighbourhood of twenty-seven miles of concrete pavement in the city of Windsor.

I believe concrete has its limitations as far as traffic is concerned, and for ordinary traffic and for residential streets it may be a little noisy, but I do not think you can improve on it for the money. I have one pavement 800 feet long and 24 feet wide on Bruce Avenue, that has tracked somewhat, but we repair it by using tar and sand. I have not spent over $5 a year in tarring it. Since building that pavement, I have added one-half inch to the thickness of the pavement. I reinforced my material. I really believe that the one-course mixture is the best; I have never yet had the top shell off. I put down two pavements last year and I am convinced that the one-course is the best. That is the Wayne County specification.

As you know, concrete pavement is something that nearly everybody can make, and that is probably the greatest trouble in connection with it. All classes of men are doing the work, but where it is properly laid I believe it is a good pavement. Windsor has been the Mecca for people who have investigated the concrete pavement and, if it continues to be a success, Windsor will deserve a great deal of credit for first introducing it.

I put down the concrete 6 inches all the way across the street, of course making it conform to the contour of the street. I expect to pave one street this year and I am going to make it 7½ inches in the middle and 6 inches on the side. We put tile on both sides of the street 2 feet 6 inches below the surface. We have a heavy clay soil. For reinforcing, we use No. 9 Wire Fence. Our joints are 40 feet apart, and we finish with a float.

I would strongly impress upon everybody the necessity for insisting on railway companies building a foundation under their tracks. Wherever they have not put a foundation under the tracks, my experience has been that the roadway is destroyed. The track will go down and the pavement will turn in. Nine times out of ten the track will be 4 or 5 inches higher. Street railway tracks are a serious proposition.

All these concrete pavements track and I do not think you can prevent it, but we keep them well in repair by putting in tar and sand twice a year. Our total repairs last year cost us $1,500.

"CREOSOTED WOOD BLOCK PAVEMENTS."

ANDREW F. MACALLUM, ESQ., CITY ENGINEER, HAMILTON, ONTARIO.

For fifty or sixty years before wood blocks were subject to treatment, many pavements were laid in the United States and Canada for roadways and sidewalks. In this country mostly round cedar blocks were used, although the north sidewalk of King Street East, Toronto, Ont., was paved with a patented block known as the Nicholson pavement. These pavements, while satisfactory for a year or two,

soon decayed and in a comparatively short time were removed. In most of these pavements, little care was taken in laying or in the preparation of the foundation, which was generally plank laid upon the natural ground.

After years of repeated failures, attention was directed to the use of preservatives, which in the first experiments made consisted in placing thoroughly dried blocks in a bath of creosote heated to a temperature of about 210 degrees Fahrenheit until about three pounds per cubic foot of creosote were absorbed. While these pavements were fairly successful, it was soon realized that the best results could not be secured by dipping the blocks, and the blocks were then treated with creosote under pressure until they absorbed from ten to twelve pounds of oil per cubic foot. Such a pavement laid in Indianapolis in 1898 gave such good results that city engineers began to appreciate the possibilities of treated wooden blocks and better results were obtained. On Tremont Street in Boston, a wood block pavement treated with creo-resinate process, composed of one-half creosote oil and one-half resin, was laid in 1898. The writer saw this pavement last October, and it was still in good condition after sixteen years of heavy traffic. A small piece of similarly treated wood block was laid in Toronto on the west side of Yonge Street, at Front Street, opposite the head office of the Bank of Montreal, in 1896, and was still in good condition when taken up for a new pavement about two years ago. The writer also examined such pavements in New York on Church and Warren Streets after they had been in use for nine years under the heaviest kind of traffic, and they were still in good condition. In the City of Hamilton, probably more treated wood block pavements have been laid than in any other city in Canada, and the first pavements laid in 1909 are as good as when laid and, although subject to the heaviest traffic in that manufacturing city, have not to date cost a cent for maintenance.

These examples, which I have mentioned, are but a few of the numerous examples showing permanence and suitability of this form of pavement for streets carrying heavy traffic. I may also say that it has also been laid on residential streets, where the residents assume its greater cost to asphalt for the added comfort through its quietness under traffic.

The wood principally used has been long leaf (yellow) southern pine, which from experience has been found to give excellent results. Most specifications now, however, admit Norway pine, tamarac and white birch, as a result of experimental pavements laid in Minneapolis, which showed the suitability of these woods. No doubt other species of wood make satisfactory pavements but, on account of the incomplete knowledge of their value, city engineers as a rule prefer a wood that has proved satisfactory.

The blocks are from three to four inches wide and vary in depth from three to four and one-half inches, with a length of from five to ten inches. As for all timber specifications, the blocks should be sound, free from large or loose knots, shakes, worm-holes and other similar defects. As to the proportion of sap and heart-wood, the present specifications are not very rigid, as experience has shown that treated blocks having both sap-wood and heart-wood do not vary in their wearing qualities.

The preservative used is a creosote oil, having a specific gravity of from 1.08 to 1.14, containing a percentage of tar free from carbon. Coal tar oils are used in preference to water gas creosote, as sufficient experiments have not yet been carried out with the water gas creosote to determine its relative value. The writer has been corresponding with a number of city engineers with a view to obtaining opinions as to the most satisfactory amount of treatment required per

cubic foot of block according to the experience of each city, and in replies from twenty cities in the United States has ascertained that six of these cities use 16 pounds, two of them 18 pounds, and twelve of them 20 pounds, depending to some extent on local conditions.

Laying the Pavement.

The base for wood block pavements should be of concrete from five to six inches deep, having the crown parallel to the finished crown on the blocks. An uneven or irregular base is detrimental to any pavement, as it is liable to cause a depression in the surface to hold water, which the repeated impacts of wagon-wheels is certain to increase, giving an uneven surface. Upon this concrete base is placed either a sand or mortar cushion. This cushion is usually one inch deep and has its surface struck by templates to a surface parallel to the contour of the finished pavement. Where sand is used, the sand is such that it will all pass through a quarter inch screen, besides being clean. If a mortar cushion be used, some engineers use a proportion of one of cement to three of clean sand, to which sufficient water is added to insure the proper setting of the cement. Other engineers obtain good results by mixing and placing the cement and sand dry. This cushion is simply a means of securing a uniform surface for the blocks to rest upon and distribute the load. Alongside or between street-car tracks, however, or on grades, sand cushions are apt to become uneven or flow, caused by the vibration of the rails or by water getting in alongside the rails, so that under these circumstances a concrete cushion should be used. Away from the car tracks, the question of whether a sand or mortar cushion should be used is a matter of opinion. Sand gives a better cushioning effect, and the blocks do not have to be rolled so soon after laying as when a mortar cushion is used.

English and French practice does away with this cushion altogether, but the concrete base is finished off as smooth as a concrete sidewalk and to the exact contour of the surface of the pavement. This extra care and workmanship obtain results that are excellent inasmuch as the finished surface of the blocks has no depressions and consequently the wheels cause no impacts.

In most cities it is not possible to lay the blocks shortly after coming out of the treating plant, and the hot sun and wind during shipment and before laying are apt to check the blocks and cause oil to exude. The blocks should be piled closely, when delivered, on the street and sprinkled before laying.

Generally the blocks are laid at right angles with the curbs, with an expansion joint at each curb of from three-quarters to an inch and a half, according to the width of the pavement. Alongside the curbs three rows of blocks are laid parallel to the curbs, with the expansion joint next to the curb. Placing a longitudinal row of blocks with an expansion joint on each side is sometimes done, but is not good practice, as the single row of blocks between the joints will almost certainly rise up above the level of the adjoining pavement as the joints close up. Cross expansion joints have been used also by the writer when the treated block used had been piled on a street for several months, but for fresh blocks properly treated they are not necessary on streets of heavy traffic. On streets of light traffic, however, there should be cross expansion joints placed from thirty to fifty feet apart and having a width of about three-quarters of an inch. It is hardly necessary to say that the blocks should be laid with the grain vertical and having the joints in adjacent rows, broken by a lap of about two inches. The blocks should be laid neither too loose nor too tight, so that a block can be raised without disturbing the surrounding blocks, or one-eighth of an inch apart. After the pave-

ment is laid, it should be rolled thoroughly with a roller varying from three to five tons, until a perfect surface has been secured with no depressions and the blocks firmly in place. There should be no difficulty in this, as the usual specification for blocks allows of a variation of but one-sixteenth of an inch in depth so that, if the foundation and cushion have been properly laid, there is usually very little trouble about depth of the blocks.

Alongside street railway tracks and about manholes, special care should be taken in laying the blocks. It is usual in such cases to thicken the cushion, so that the blocks shall be about one-quarter of an inch above the wearing surface of the rail or cover, and in a very short time the traffic will rub these blocks down to the level of the rail. Alongside rails, to prevent water flowing down and under the blocks, two methods are used: one is to place a specially cut creosoted plank under the rail head to give a vertical surface against which the blocks are paved; and the second and usual method is to plaster the web with a rich mixture of sand and cement to the width of the rail head, and the blocks are then laid against this. As with other pavements, it has been found that the girder lip rail is more satisfactory than the ordinary T-rail, unfortunately in use in most towns, for the permanence of the block on the inside or gauge side of the rail. Incidentally it may be said that no pavement will be satisfactory alongside a street railway track if the rails lack sufficient weight, stiffness and foundation to prevent movement, especially at the joints.

There is diversity of opinion among engineers as to the best joint filler to be used. The American Society of Municipal Improvements recommend a suitable bituminous filler when the blocks are laid upon a sand cushion, and a sand filler when laid on a mortar cushion. It is claimed for the bituminous filler, which fills the joints between the blocks two-thirds their depth (the remaining depth filled with sand) that it makes an absolutely waterproof pavement and that it eliminates all expansion difficulties, as each block is surrounded with an individual expansion joint. Unless the filler is a suitable asphaltic cement with a high melting point and low penetration, there is apt to be a sticky surplus left on the surface. This filler will cost about 15 cents a square yard more than a sand filler. A cement grout filler has been used, but unless the traffic can be kept off the pavement for at least ten days, it is little superior to a sand filler.

The sand filler is generally used on streets of heavy traffic; the sand being coarse and sharp grained, and preferably heated before placing. The writer has used with excellent results a bituminous filler between and one foot outside of street railway tracks, and a sand filler for streets. From results obtained, he does not consider the extra expense in using bituminous filler justified for such streets unless the traffic be very light. On bridge floors, it is better practice to use a bituminous filler with the blocks. After the pavement is rolled, sand to the depth of about half an inch is spread over the surface and the street is thrown open to traffic.

This method of construction is satisfactory up to a three per cent. grade, beyond which the blocks are laid in a different manner. The crown should be as light as possible, being just sufficient to shed the water freely, which applies also to the pavements between street railway tracks. When the grade of the street exceeds three per cent., a creosoted lath is inserted between each cross row of blocks to leave a space of about three-eighths of an inch. The lath fills this space practically for two-thirds of the depth of the block, and a bituminous filler is used. This method of laying the blocks forms a good foothold for horses, and is satisfactory up to and including a six per cent. grade.

One of the criticisms made of treated wood block pavements is that it is slippery, but in the writer's experience he has found that there is very little difference between these blocks and sheet asphalt pavements. When covered with a light frost or snow, or when the weather is foggy and damp, the pavement may become objectionably slippery.

In traffic observations made in Philadelphia, New York and other cities the evidence shown by the engineer at these places indicated that, where treated wooden blocks and granite blocks were on parallel streets, seventy per cent. of the teaming went on the wooden blocks. On Stuart Street in the City of Hamilton, the writer laid treated wooden blocks between the street-car rails and granite blocks between the outside rails and curbs, the pavement being on a five per cent. grade. Although most of the traffic was of a heavy teaming nature, it was found that fully eighty per cent. of the traffic, except on wet days, was on the wooden blocks.

The first cost of wood block pavement is undoubtedly higher than that of most of the other paving materials, averaging in the City of Hamilton from $2.85 to $3.00 per square yard, exclusive of grading. When its cheapness of maintenance, ease of cleaning, low tractive resistence and durability are taken into consideration, this pavement, with its relatively high first cost, will compare favourably with and prove ultimately cheaper than one lower in first cost.

PROF. LAING: What is the object of such a high penetration that is given in many instances? We go to these concerns, and they say they would not put in so much if it were not for the specifications they have to comply with that are drawn up by city engineers. Penetration to the point of bleeding, such as we see in many instances, is objectionable to traffic. Is there any reason why the penetration should be carried as high as twenty pounds?

MR. MACALLUM: Yes, the average pine will carry up to 24 lbs. and in some cases 26 lbs. of treatment. The more treatment you get, the less possibility you have of expansion. A great deal of the bleeding you have noticed is very often caused by the poor material they use in the treating. Very often there is a lot of adulteration in the oil. On Broad Street, Philadelphia, they have great trouble with the bleeding of the blocks, and it was shown to be caused by the improper material used in the treatment. As a rule, in nearly all pavements in this climate, there will be a little bleeding the first year, and if you find more bleeding than that, it is because of some adulteration put into the treatment.

PROF. LAING: Is there any relation between the amount of impregnation you specify to the traffic? It is conceivable that, in some instances, you may have a wood block under such conditions that it would wear out before it would rot out?

MR. MACALLUM: The French engineers in Paris found that, when they used a treatment of less than 10 lbs, the blocks rotted before they wore out.

A DELEGATE: Was that heart-wood?

MR. MACALLUM: No, Australian wood.

A DELEGATE: Does it not happen that heart-wood requires very much less oil than sap-wood?

MR. MACALLUM: Yes.

A DELEGATE: Sap-wood trees are scrub stuff that is not good for anything else but making paving blocks, and by soaking them with oil they are preserved?

MR. MACALLUM: Yes.

A DELEGATE: The speaker mentioned that pine wood holds 24 to 26 lbs. of oil. I believe the most approved process of treating blocks now is to put in that much oil and then draw a part of it out again by the vacuum process. I saw some blocks

that had been treated with 24 lbs. of oil, and then the oil was drawn out again until there was only about 15 or 16 lbs. left. That insures very good penetration. After the oil has been put in and the walls of the cells coated with the oil, the oil can be drawn out again because, if the walls are well coated with creosote, nothing can feed on them and decay will not set in. There is another process, called the full-cell process; that is supposed to be a very wasteful process, and it is supposed to be unnecessary to leave all that oil in. Of course, sufficient oil has to be left in to waterproof the block as well as preserve it. It is hardly likely that the block will wear out before rotting out, if a proper kind of wood is used, because these blocks will wear for forty years if they are properly preserved. I would be interested to know whether Mr. Macallum would advocate the putting in of 24 lbs. of oil and afterwards reducing it to 14 lbs. Would he consider that proper treatment?

MR. MACALLUM: The blocks may lie around for a long time before they are used, and there may be evaporation and, if you bring it down to 16 or 18 lbs., there would be a certain amount of water absorbed. The block would be preserved all right but it might absorb water, and that is something which we must prevent or the blocks will swell.

A DELEGATE: I understand sufficient oil has to be left in to waterproof the block as well as preserve it. Do you consider 24 lbs. is necessary for that purpose?

MR. MACALLUM: Yes, it was found that down to 12 lbs. it was not sufficient. On Wellington Street in the City of Toronto and on Court Street they put in a dipped block. It is found that by treating it to 20 lbs. it can be guaranteed for 15 years and it will outlast the granite block; but 24 lb. treatment is never specified. I saw one specification for 22 lbs., but 20 lbs. is the highest in most cases.

A DELEGATE: Would not a 16 lb. treatment waterproof the block?

MR. MACALLUM: I have had blocks that have been treated 20 lbs., and they did not bleed at all. The bleeding does not do any harm. Of course, it is disagreeable for people walking along the streets, because they carry it in on the carpets.

PROF. LAING: Have you had any experience in the use of formaldehyde as a preservative?

MR. MACALLUM: No, I have never used it.

A DELEGATE: Formaldehyde is a preservative and will prevent all sorts of decay, and after it is drawn off they treat it with a bituminous material on the outside.

MR. MACALLUM: I have never used block treated in that way.

THE CHAIRMAN: This closes the lectures for this Convention. This has been one of the longest, and, I believe, the best attended Road Conventions ever held in the Dominion of Canada. We have to thank the faithful crowd who have remained to the last for their kind and patient attendance, and I will now declare the Congress closed.

ONTARIO GOOD ROADS ASSOCIATION

FINANCIAL STATEMENT, 1914-1915.

Receipts.

1914.			
Feb.	26.	Balance in bank	$250 62
May	31.	Interest	1 48
Oct.	13.	Government grant for year and arrears	600 00
Nov.	30.	Interest	2 65
"	30.	Carleton County, membership for 1914	15 60

Membership.

1915.			
Mar.	10.	City of Berlin	$25 00
"	"	County of Hastings	15 00
"	"	County of Kent	15 00
"	"	Township of Etobicoke	5 00
"	"	Village of Merritton	5 00
"	"	Township of Tisdale	5 00
"	"	County of Brant	15 00
"	"	Township of Darlington	5 00
"	"	Township of Toronto Gore	5 00
"	"	Township of Coleman	5 00
"	"	Township of East Flamboro	5 00
"	"	Township of Brantford	5 00
"	"	Village of Grimsby	5 00
"	"	County of Norfolk	15 00
"	"	County of Prescott and Russell	15 00
"	"	Township of Pickering	5 00
"	"	Village of Winchester	5 00
"	"	Village of Port Stanley	5 00
"	"	Township of Bertie	5 00
"	"	Township of Chinguacousy	5 00
"	"	Township of North Grimsby	5 00
"	"	Township of Oakland	5 00
"	"	County of Simcoe	15 00
"	"	County of Middlesex	15 00
"	"	Town of Ojibway	15 00
"	"	County of Perth	15 00
"	"	Township of Paipoonge	5 00
"	"	Village of Burk's Falls	5 00
"	"	County of Elgin	15 00
"	"	County of Lennox and Addington	15 00
"	"	County of York	15 00
"	"	Township of York	5 00
"	"	City of Toronto	25 00
"	26.	Outstanding cheques	268 07
			$1,463 42

Disbursements.

1914.			
Mar.	4.	K. W. McKay, printing	$2 60
"	"	N. Vermilyea, expenses	16 00
"	"	R. H. Lush, expenses	10 00
"	"	J. J. Parsons, expenses	12 00
"	"	S. L. Squire, expenses	14 00
"	"	J. A. Sanderson, expenses	18 00
"	"	J. H. Garbutt, expenses	8 85
"	"	A. Denholm, expenses	11 55
"	16.	W. J. Mills, chairs	24 00
"	"	Reporting	75 00

Aug.	4.	W. D. Lawrie, caretaker	10 00
Dec.	2.	J. A. Sanderson, expenses	19 50
"	"	S. L. Squire, expenses	8 50
"	"	F. A. Senecal, expenses	24 50
"	"	J. J. Parsons, expenses	8 00
"	"	C. R. Wheelock, expenses	15 00
"	"	W. H. Pugsley, expenses	1 00
"	"	F. A. Senecal, expenses	68 05
"	31.	Geo. S. Henry, expenses	50 00
1915.			
Mar.	15.	Geo. S. Henry, Secretary's allowance	50 00
"	"	Municipal World circulars *re* Convention	17 27
"	"	Postage and exchange	2 00
"	"	J. A. Sanderson, expenses	54 00
"	25.	C. R. Wheelock, expenses	46 80
"	"	S. L. Squire, expenses	42 00
"	"	R. H. Lush, expenses	46 00
"	"	L. Allen, expenses	60 00
"	26.	Cash in bank	423 80
"	"	Cash on hand	325 00
			$1,463 42

HON. FINLAY G. MACDIARMID.

MINISTER OF PUBLIC WORKS, ONTARIO

ROBERT EDGAR

SECRETARY LABOUR BUREAU

FIFTEENTH REPORT

OF

The Bureau of Labour

OF THE

PROVINCE OF ONTARIO

For the Year Ending December 31st

1914

PRINTED BY ORDER OF

THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO:
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1915

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29-37 Richmond Street West
TORONTO

To His Honour John Strathearn Hendrie,

Lieutenant-Governor of Ontario.

May it Please Your Honour:

The undersigned has the honour to present herewith for your consideration the Report of the Bureau of Labour of the Province of Ontario for the year 1914.

I have the honour to be,

Your Honour's most obedient servant,

FINLAY G. MACDIARMID,

Minister of Public Works.

To the Honourable Finlay G. Macdiarmid,

Minister of Public Works, Ontario,

Sir,—I have the honour of submitting to you herewith the Fifteenth Report of the Bureau of Labour.

I have the honour to be, Sir,

Your obedient servant,

ROBERT EDGAR,

Secretary.

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FIFTEENTH REPORT

OF THE

BUREAU OF LABOUR

1914

INTRODUCTION

The fifteenth annual report of the Bureau of Labour of the Province of Ontario continues to show the usual steady progress and unceasing growth of its work.

There has been again an increase of the operations of the six Free Employment Bureaus, situated at Berlin, Brantford, Hamilton, London, Ottawa and Walkerville. 1,933 applicants having secured situations by this means.

The number of returns by municipal clerks have shown a further increase. There have been 826 as compared with 815 for 1912 and 807, 786, 769, 756, 704, 559 and 227 for the seven preceding years. There was still, however, much work which should not be needed to maintain this growth, many clerks requiring repeated notices before sending in reports or rendering them more complete and accurate, self-confessed defective bookkeeping and incomplete records are apparently the main causes of their difficulties. The statistical tables, even though consequently incomplete, show a gratifying progress. The reports give 26,253 new buildings erected in 1913 at a cost of $68,824,692; expenditure on permanent improvements, such as roadways, bridges, etc., $10,116,528; and on sanitation, including sewers, $5,597,798. The 20 cities report 16,855 new buildings, costing $50,555,996; expenditure on permanent improvements, $6,044,448; and on sanitation, $4,568,998. The 129 towns reporting (3 failing to do so) give 3,685 new buildings, costing $10,614,065; expenditure on permanent improvements, $1,571,003; and sanitation, $834,916. The 145 incorporated villages reporting (1 defaulting) give 825 new buildings, costing $1,685,757; expenditure on permanent improvements, $234,800; and on sanitation, $119,286. The 548 townships and groups of townships reporting (9 not doing so) give 4,888 new buildings, costing $5,968,874; expenditure on permanent improvements, $2,266,277; and on sanitation, $74,598. As shown by their detailed reports the clerks afford useful information as to the manufacturing establishments started during the year and the openings for other industries.

The statistics given for five years concerning public utilities owned and operated by the municipalities are continued, showing an increased capitalization

amounting to $54,811,174 for the 243 municipalities making returns. The cities report assets of this nature amounting to $40,649,659; the towns $11,644,161; villages $1,670,518; and townships $846,836. In another table these public utilities are classified as follows: waterworks, $34,727,807; electric lighting, $13,597,274; gas, $750,568; street railways, $3,755,374; power, $687,158; telephone, $1,233,933; miscellaneous, $59,060.

The increase in the number of local unions returning their schedules is maintained, there being 515 as compared with 491 last year and 477, 384, 335, 358, 320, 271 and 156 for the seven preceding years. Though there is this improvement these returns are evidently still incomplete, some unions still refusing or neglecting to supply the required information. As I have before pointed out this policy is hard to understand as organized labour in every other civilized country, instead of showing his reticence, is eager to make the best possible showing of its growth and influence.

The manufacturers still continue to send in an increased number of returns, there being 953 as compared with 911 last year and 867, 759, 679, 652, 592, 427 and 205 for the previous years, of these 103 were too incomplete for tabulation, leaving to be thus treated 850 establishments employing 67,106 persons, as compared with 822 employing 61,637 persons, 707 employing 51,095 persons, 642 employing 49,090 persons, 610 employing 39,150, 536 employing 42,646, 384 employing 35,316 and 153 employing 8,505 in the eight preceding years. The aggregate number of days in operation in these 850 establishments was 234,504 as compared with 235,000, 229,473, 202,306, 183,185, 172, 573, 154,905, 113,432 and 43,718 in the previous year. The product was $175,657,467 as compared with $156,712,991; $139,990,138; $122,726,571; $111,392,169; $59,479,586; $100,097,507; and $18,473,139 previously. The wages were $34,681,997 as compared with $37,806,066; $28,022,416; $23,361,134; $21,392,444; $16,681,496; $19,123,227; $15,869,337; and $3,458,419 in the previous years. The average wage rate per year was $530.01; and per day $1.92, as compared with $532.70 and $1.81; $495.10 and $1.74; $467.80 and $1.64; $452.15 and $1.58; $433.19 and $1.58; $495.00 and $1.60; $449.43 and $1.52; and $406.69 and $1.48 previously. There is no authoritatively nominal list of industrial establishments in the Province, so we have to make one from various more or less trustworthy sources, and consequently these statistics are not complete. Then, too, some manufacturers are negligent as to replying fully and a few refuse to give any information. There are a sufficient number of adequate replies in each of the 32 sub-divisions to give a fairly representative view of the general industrial condition.

Such subjects as labour legislation, trade disputes, legal decisions, directories of labour organizations, and bureaus of labour, etc., are contained as usual in this report. The correspondence continues to grow. 4,500 copies of the Fourteenth Annual Report were circulated, many through personal application. The usual schedules and circulars were mailed to secretaries of labour unions, clerks of municipalities, and manufacturers. Over one thousand letters were sent out

asking for delayed schedules or further details, giving information required, and for similar objects within the scope of this Bureau. There were also many personal interviews in regard to fair wages and hours of public contracts, labour legislation, decisions by the courts, industrial statistics, etc. As usual there were requests for information by students of political economy from the university and elsewhere.

ROBT. EDGAR,

Secretary,

Bureau of Labour.

MUNICIPAL STATISTICS.

The following is a list of the cities, towns, incorporated villages and townships which responded to the schedules sent out to all the municipal clerks. Succeeding this are the reports in detail from the clerks giving accounts of the industries started in 1913, and the openings for others, besides the statistical information which is tabulated as usual. All the cities, nearly all the towns and villages, and all but about nine of the townships made returns, the increase that has obtained for some years past being continued, but this was only secured by repeated applications in many cases, both for the reports themselves and for additional information where they were incomplete.

NOTE.—C. for City; Tn. for Town; V. for Village; Tp. for Township.

Aberdeen, Tp.
Abinger, Tp.
Acton, V.
Adelaide, Tp.
Adjala, Tp.
Ailsa Craig, V.
Admaston, Tp.
Adolphustown, Tp.
Albermarle, Tp.
Alberton, Tp.
Albion, Tp.
Aldborough, Tp.
Alexandria, Tn.
Alfred, Tp.
Algona N., Tp.
Algona S., Tp.
Alice & Fraser, Tps.
Alliston, Tn.
Almonte, Tn.
Alnwick, Tp.
Alvinston, V.
Amabel, Tp.
Amaranth, Tp.
Ameliasburg, Tp.
Amherst Island, Tp.
Amherstburg, Tn.
Ancaster, Tp.
Anderdon, Tp.
Anglesea, Tp.
Anson and Hindon, Tps.
Anstruther, Tp.
Appleby, Tp.
Arkona, V.
Armour, Tp.
Arnprior, Tn.
Arran, Tp.
Artemesia, Tp.
Arthur, Tp.
Arthur, V.
Ashby, Tp.
Ashfield, Tp.
Assiginack, Tp.
Athens, V.
Athol, Tp.
Atwood, Tp.
Augusta, Tp.
Awenge, Tp.
Aylmer, Tn.
Ayr, V.

Bagot and Blythfield, Tps.
Balfour, Tp.
Bancroft, V.
Bangor, Tp.
Barrie, Tn.
Barrie, Tp.
Barton, Tp.
Bastard and Burgess Tps.
Bath, V.
Bathurst, Tp.
Bayfield, V.
Bayham, Tp.
Beamsville, V.
Beaverton, V.
Beckwith, Tp.
Bedford, Tp.
Beeton, V.
Belle River, V.
Belleville, C.
Belmont & Methuen, Tps.
Bentinck, Tp.
Berlin, C.
Bertie, Tp.
Beverley, Tp.
Bexley, Tp.
Biddulph, Tp.
Billings Tp.
Binbrook, Tp.
Blandford, Tp.
Blanshard, Tp.
Blenheim, Tn.
Blenheim, Tp.
Blezard, Tp.
Blind River, Tn.
Bloomfield, V.
Blue, Tp.
Blyth, V.
Blythfield, Tp.
Bobcaygeon, V.
Bolton, V.
Bonfield, Tn.
Bonfield, Tp.
Bosanquet, Tp.
Bothwell, Tn.
Bowmanville, Tn.
Bracebridge, Tn.
Bradford, V.

Brampton, Tn.
Brant, Tp.
Brantford, C.
Brantford, Tp.
Bridgeburg, V.
Brighton, Tp.
Brighton, V.
Brock, Tp.
Brockville, Tn.
Bromley, Tp.
Brooke, Tp.
Brougham, Tp.
Bruce, Tp.
Bruce Mines, Tn.
Brudell and Lynedock, Tps.
Brunel, Tp.
Bruton, Tp.
Brussels, V.
Buchanan, Tp.
Bucke, Tp.
Burford, Tp.
Burgess N., Tp.
Burgess S., Tp.
Burk's Falls, V.
Burleigh and Anstruther, Tps.
Burlington, V.
Burns, Tp.
Burpee, Tp.

Cache Bay, Tn.
Caistor, Tp.
Caldwell, Tp.
Caledon, Tp.
Caledonia, Tp.
Caledonia, V.
Calvin, Tp.
Cambridge, Tp.
Camden, Tp.
Camden E., Tp.
Cameron, Tp.
Canborough, Tp.
Canonto N., Tp.
Canonto S., Tp.
Caradoc, Tp.
Carden, Tp.
Cardiff, Tp.
Cardinal, V.
Cardwell, Tp.

Carleton Place, Tn.
Carling, Tp.
Carlow, Tp.
Carnarvon, Tp.
Carrick, Tp.
Cartwright, Tp.
Cashel, Tp.
Casselman, V.
Cassimer, Jennings and Appleby, Tps.
Cavan, Tp.
Cavendish, Tp.
Cayuga, V
Cayuga N., Tp.
Cayuga S., Tp.
Chaffey, Tp.
Chamberlain, Tp.
Chandos, Tp.
Chapleau, Tp.
Chapman, Tp.
Chapple, Tp.
Charlottenburg, Tp.
Charlotteville, Tp.
Chatham, C.
Chatham, Tp.
Chatsworth, V.
Chelmsford, Tn.
Chesley, Tn.
Chesterville, V.
Chinquacousy, Tp.
Chisholm, Tp.
Chippawa, V.
Christie, Tp.
Clara, Tp.
Clarence, Tp.
Clarendon & Miller, Tps.
Clarke, Tp.
Clifford, V.
Clinton, Tn.
Clinton, Tp.
Clyde, Tp.
Cobalt, Tn.
Cobden, V.
Cobourg, Tn.
Cochrane, Tn.
Cockburn Island, Tp.
Colborne, Tp.
Colborne, V.
Colchester N., Tp.

Colchester S., Tp.
Coldwater, V.
Coleman, Tp.
Collingwood, Tn.
Collingwood, Tp.
Conmee, Tp.
Copper Cliff, Tn.
Cornwall, Tn.
Cornwall, Tp.
Courtright, V.
Cramahe, Tp.
Creemore, V.
Crosby N., Tp.
Crosby S., Tp.
Crowland, Tp.
Crozier, Tp.
Culross, Tp.
Cumberland, Tp.

Dalhousie and Sherbrooke N., Tps.
Dalton, Tp.
Darling, Tp.
Darlington, Tp.
Dawn, Tp.
Day and Bright, Additional, Tps.
Delaware, Tp.
Delhi, V.
Denbigh, Abinger and Ashby, Tps.
Denison, Tp.
Derby, Tp.
Dereham, Tp.
Deseronto, Tn.
Digby, Tp.
Dilke, Tp.
Dorchester N., Tp.
Dorchester S., Tp.
Douro, Tp.
Dover, Tp.
Downie, Tp.
Draper, Tp.
Drayton, V.
Dresden, Tn.
Drummond, Tp.
Drury, Denison and Graham, Tps.
Dryden, Tn.
Dudley, Tp.
Dumfries N., Tp.
Dumfries S., Tp.
Dummer, Tp.
Dungannon, Tp.
Dundalk, V.
Dundas, Tn.
Dunn, Tp.
Dunnville, Tn.
Dunwich, Tp.
Durham, Tn.
Dutton, V.
Dymond, Tp.
Dysart, etc., Tps.

Easthope N., Tp.
Easthope S., Tp.
Eastnor, Tp.
Eastview, Tn.
Edwardsburg, Tp.
Effingham, Tp.
Eganville, V.
Egremont, Tp.
Ekfrid, Tp.
Elderslie, Tp.
Eldon, Tp.
Elizabethtown, Tp.
Ellice, Tp.
Elma, Tp.
Elmira, V.
Elmsley N., Tp.
Elmsley S., Tp.
Elora, V.
Elzevir and Grimsthorpe, Tps.
Embro, V.
Emily, Tp.
Emo, Tp.
Englehart, Tn.
Enniskillen, Tp.
Ennismore, Tp.
Eramosa, Tp.
Erin, Tp.
Erin, V.
Ernesttown, Tp.
Escott Front, Tp.
Escott Rear, Tp.
Esquesing, Tp.
Essa, Tp.
Essex, Tn.
Etobicoke, Tp.
Euphemia, Tp.
Euphrasia, Tp.
Evanturel, Tp.
Exeter, V.
Eyre, Tp.

Faraday, Tp.
Fenelon, Tp.
Fenelon Falls, V.
Fergus, V.
Ferris, Tp.
Finch, V.
Finch, Tp.
Fitzroy, Tp.
Flamborough E., Tp.
Flamborough W., Tp.
Flesherton, V.
Flos, Tp.
Foley, Tp.
Ford City, V.
Forest, Tn.
Fort Erie, V.
Fort Frances, Tn.
Fort William, C.
Fraser, Tp.
Fredericksburgh, N., Tp.
Fredericksburgh, S., Tp.
Fullarton, Tp.

Gainsborough, Tp.
Galt, Tn.
Galway & Cavendish, Tps.
Gananoque, Tn.
Garafraxa E., Tp.
Garafraxa W., Tp.
Garden Island, V.
Georgetown, V.
Georgina, Tp.
Glamorgan, Tp.
Glanford, Tp.
Glencoe, V.
Glenelg, Tp.
Gloucester, Tp.
Goderich, Tn.
Goderich, Tp.
Gordon, Tp.
Gore Bay, Tn.
Gosfield N., Tp.
Gosfield S., Tp.
Goulburn, Tp.
Gower N., Tp.
Gower S., Tp.
Graham, Tp.
Grand Valley, V.
Grantham, Tp.
Grattan, Tp.
Gravenhurst, Tn.
Greenock, Tp.
Grey, Tp.
Griffith and Matawatchan, Tps.
Grimsby N., Tp.
Grimsby S., Tp.
Grimsthorpe, Tp.
Guelph, C.
Guelph, Tp.
Guildford, Tp.
Gwillimbury E., Tp.
Gwillimbury N., Tp.
Gwillimbury W., Tp.

Hagar, Tp.
Hagarty & Richards, Tps.
Hagerman, Tp.
Hagersville, V.
Haileybury, Tn.
Haldimand, Tp.
Hallam, Tp.
Hallowell, Tp.
Hamilton, C.
Hamilton, Tp.
Hanmer, Tp.
Hanover, Tn.
Harburn, Tp.
Harcourt, Tp.
Harley, Tp.
Harris, Tp.
Harriston, Tn.
Harrow, Tp.
Harvey, Tp.
Harwich, Tp.
Hastings, V.
Havelock, Tp.
Hawkesbury, Tn.
Hawkesbury E., Tp.
Hawkesbury W., Tp.
Hay, Tp.
Head, Maria & Clara, Tps.
Hensall, V.
Hepworth, V.
Hespeler, Tn.
Herschel, Tp.
Hibbert, Tp.
Hilliard, Tp.
Hilliar, Tp.
Hilton, Tp.
Himsworth N., Tp.
Himsworth S., Tp.
Hinchinbrooke, Tp.
Hindon and Anson, Tps.
Holland, Tp.
Holland Landing, V.
Hope, Tp.
Horton, Tp.
Houghton, Tp.
Howard, Tp.
Howe Island, Tp.
Howick, Tp.
Howland, Tp.
Hudson, Tp.
Hullett, Tp.
Humberstone, V.
Humberstone, Tp.
Humphrey, Tp.
Hungerford, Tp.
Huntingdon, Tp.
Huntley, Tp.
Huntsville, Tn.
Huron, Tp.

Ignace, Tp.
Ingersoll, Tn.
Innisfil, Tp.
Iroquois, V.

Jaffray and Melick, Tps.
James, Tp.
Jarvis, V.
Jennings, Tp.
Jocelyn, Tp.
Johnston, Tp.
Joly, Tp.
Jones, Tp.

Kaladar, Anglesea & Effingham, Tps.
Kearney, Tn.
Keewatin, Tn.
Kemptville, V.
Kennebec, Tp.
Kenora, Tn.
Keppel, Tp.
Kerns, Tp.
Killaloe Station, V.
Kincardine, Tn.
Kincardine, Tp.
King, Tp.
Kingston, C.
Kingston, Tp.
Kingsville, Tn.
Kinloss, Tp.
Kitley, Tp.
Korah & Parke, Tps.

Laird, Tp.

Lake, Tp.
Lakefield, V.
Lanark, V.
Lanark, Tp.
Lancaster, V.
Lancaster, Tp.
Landsdowne Front, Tp.
Latchford, Tn.
Lavallee, Tp.
Lavant, Tp.
Lawrence, Tp.
Laxton, Digby and Longford, Tps.
Leamington, Tn.
Leaside, Tn.
Leeds & Lansdowne Front, Tps.
Leeds & Lansdowne Rear, Tps.
Limerick, Tp.
Lindsay, Tn.
Lindsay, Tp.
Listowel, Tn.
Little Current, Tn.
Livingston, Tp.
Lobo, Tp.
Lochiel, Tp.
Logan, Tp.
London, C.
London, Tp.
Longford, Tp.
Longueuil, Tp.
Loughborough, Tp.
Louth, Tp.
Lucan, V.
Lucknow, V.
Luther E., Tp.
Luther W., Tp.
Lutterworth, Tp.
Lynedoch, Tp.

McClintock, Tp.
McClure, Tp.
McDougall, Tp.
McGillivray, Tp.
McIrvine, Tp.
McKellar, Tp.
McKillop, Tp.
McKim, Tp.
McLean and Ridout, Tps.
McMurrich, Tp.
McNab, Tp.
Macaulay, Tp.
Macdonald, Meredith, and Aberdeen, Tps.
Machar, Tp.
Machin, Tp.
Madoc, V.
Madoc, Tp.
Maidstone, Tp.
Malahide, Tp.
Malden, Tp.
Manvers, Tp.
Mara, Tp.
Maria, Tp.
March, Tp.
Mariposa, Tp.
Markham, Tp.
Markham, V.
Marlborough, Tp.
Marmora and Lake, Tps.
Marmora, V.
Martland, Tp.
Maryborough, Tp.
Marysburgh N., Tp.
Marysburgh S., Tp.
Massey, Tn.
Matawatchan, Tp.
Matchedash, Tp.
Matheson, Tn.
Matilda, Tp.
Mattawa, Tn.
Mattawan, Tp.
Maxville, V.
May, Tp.
Mayo, Tp.
Meaford, Tn.
Medonte, Tp.
Medora & Wood, Tps.
Melancthon, Tp.
Merrickville, V.
Merritton, V.
Mersea, Tp.
Metcalfe, Tp.
Methuen, Tp.
Middleton, Tp.
Midland, Tn.
Millbrook, V.
Milton, W., Tn.
Miller, Tp.
Milverton, V.
Mimico, V.
Minden, Tp.
Minto, Tp.
Mitchell, Tn.
Monaghan N., Tp.
Monaghan S., Tp.
Monck, Tp.
Monmouth, Tp.
Mono, Tp.
Montague, Tp.
Monteagle and Herschel, Tps.
Moore, Tp.
Morley, Tp.
Mornington, Tp.
Morris, Tp.
Morrisburg, V.
Morrison, Tp.
Mosa, Tp.
Moulton, Tp.
Mount Forest, Tn.
Mountain, Tp.
Mulmur, Tp.
Murray, Tp.
Muskoka, Tp.

Nairn and Lorne, Tps
Napanee, Tn.
Nassagaweya, Tp.
Neebing, Tp.
Neelon and Garson, Tps.
Nelson, Tp.
Nepean, Tp.
Nepigon, Tp.
Neustadt, V.
Newboro, V.
Newburgh, V.
Newbury, V.
Newcastle, V.
New Hamburg, V.
New Liskeard, Tn.
New Toronto, V.
Newmarket, Tn.
Niagara, Tn.
Niagara, Tp.
Niagara Falls, C.
Nichol, Tp.
Nightingale, Tp.
Nipissing, Tp.
Nissouri E., Tp.
Nissouri W., Tp.
Normanby, Tp.
North Bay, Tn.
Norwich, V.
Norwich N., Tp.
Norwich S., Tp.
Norwood, V.
Nottawasaga, Tp.

Oakland, Tp.
Oakley, Tp.
Oakville, Tn.
O'Connor, Tp.
Oil Springs, V.
Ojibway, Tn.
Olden, Tp.
Oliver, Tp.
Omemee, V.
Oneida, Tp.
Onondaga, Tp.
Ops, Tp.
Orangeville, Tn.
Orford, Tp.
Orillia, Tn.
Orillia, Tp.
Oro, Tp.
Oshawa, Tn.
Osgoode, Tp.
Osnabruck, Tp.
Oso, Tp.
Osprey, Tp.
Otonabee, Tp.
Ottawa, C.
Owen Sound, Tn.
Oxford on Rideau, Tp.
Oxford E., Tp.
Oxford N., Tp.
Oxford W., Tp.

Paipoonge, Tp.
Paisley, V.
Pakenham, Tp.
Palmerston, Tn.
Palmerston, N. and S. Canonto, Tps.
Papineau, Tp.
Paris, Tn.
Parke, Tp.
Parkhill, Tn.
Parry Sound, Tn.
Peel, Tp.
Pelee, Tp.
Pelham, Tp.
Pembroke, Tn.
Pembroke, Tp.
Penetanguishene, Tn.
Percy, Tp.
Perry, Tp.
Perth, Tn.
Peterborough, C.
Petewawa, Tp.
Petrolea, Tn.
Pickering, Tp.
Picton, Tn.
Pilkington, Tp.
Pittsburgh, Tp.
Plantagenet N., Tp.
Plantagenet, S., Tp.
Plummer, Add., Tp.
Plympton, Tp.
Point Edward, V.
Port Arthur, C.
Port Carling, V.
Port Colborne, V.
Port Dalhousie, V.
Port Dover, V.
Port Elgin, V.
Port Hope, Tn.
Port Perry, V.
Port Rowan, V.
Port Stanley, V.
Portland, Tp.
Portsmouth, V.
Powassan, Tn.
Prescott, Tn.
Preston, Tn.
Prince, Tp.
Proton, Tp.
Puslinch, Tp.

Radcliffe, Tp.
Raglan, Tp.
Rainham, Tp.
Rainy River, Tn.
Raleigh, Tp.
Rama, Tp.
Ramsay, Tp.
Rawdon, Tp.
Rayside, Tp.
Reach, Tp.
Renfrew, Tn.
Richards, Tp.
Richmond Tp.
Richmond West, V.
Richmond Hill, V.
Ridgetown, Tn.
Ridout, Tp.
Rochester, Tp.
Rockland, Tn.
Roddick, Tp.
Rodney, V.
Rolph, Buchanan and Wylie, Tps.
Romney, Tp.
Ross, Tp.
Roxborough, Tp.
Russell, Tp.

Ryde, Tp.
Ryerson, Tp.

St. Catharines, C.
St. Edmunds, Tp.
St. Josephs, Tp.
St. Mary's, Tn.
St. Thomas, C.
St. Vincent, Tp.
Salter, May and Harrow, Tps.
Saltfleet, Tp.
Sandfield, Tp.
Sandwich, Tn.
Sandwich E., Tp.
Sandwich S., Tp.
Sandwich W., Tp.
Sarawak, Tp.
Sarnia, Tn.
Saugeen, Tp.
Sault Ste. Marie, C.
Scarborough, Tp.
Schreiber, Tp.
Scott, Tp.
Scugog, Tp.
Seaforth, Tn.
Sebastopol, Tp.
Seneca, Tp.
Seymour, Tp.
Shallow Lake, V.
Sheffield, Tp.
Shelburne, V.
Sherbrooke, Tp.
Sherbrooke N., Tp.
Sherbrooke S., Tp.
Sherwood, Jones and Burns, Tps.
Shuniah, Tp.
Sidney, Tp.
Simcoe, Tn.
Sioux-Lookout, Tn.
Smith, Tp.
Smith's Falls, Tn.
Snowden, Tp.
Sombra, Tp.
Somerville, Tp.
Sophiasburg, Tp.
Southampton, Tn.
South River, V.
Southwold, Tp.
Springer, Tp.
Springfield, V.
Stafford, Tp.
Stamford, Tp.
Stanhope, Tp.
Stanley, Tp.
Stayner, Tn.
Steelton, Tn.
Stephen, Tp.
Stephenson, Tp.
Stirling, V.
Stisted, Tp.
Storrington, Tp.
Stratford, C.
Strathroy, Tn.
Stouffville, V.
Streetsville, V.
Strong, Tp.
Sturgeon Falls, Tn.
Sturgeon Point, V.
Sudbury, Tn.
Sullivan, Tp.
Sundridge, V.
Sunnidale, Tp.
Sutton, V.
Sydenham, Tp.

Tara, V.
Tarbutt and Tarbutt Add., Tps.
Tarentorus, Tp.
Tavistock, V.
Tay, Tp.
Tecumseth, Tp.
Teeswater, V.
Tehkummah, Tp.
Thamesville, V.
Thedford, V.
Thessalon, Tn.
Thessalon, Tp.
Thompson, Tp.
Thornbury, Tn.
Thorold, Tn.
Thorold, Tp.
Thurlow, Tp.
Tilbury, Tn.
Tilbury E., Tp.
Tilbury N., Tp.
Tilbury W., Tp.
Tillsonburg, Tn.
Tiny, Tp.
Tiverton, V.
Torbolton, Tp.
Toronto, C.
Toronto, Tp.
Toronto Gore, Tp.
Tossorontio, Tp.
Townsend, Tp.
Trafalgar, Tp.
Trenton, Tn.
Trout Creek, Tn.
Tuckersmith, Tp.
Tudor and Cashel, Tps.
Turnberry, Tp.
Tweed, V.
Tyendinaga, Tp.

Usborne, Tp.
Uxbridge, Tn.
Uxbridge, Tp.

Van Horne, Tp.
Vankleek Hill, Tn.
Vaughan, Tp.
Verulam, Tp.
Vespra, Tp.
Victoria Harbour, V.
Vienna, Tn.

Wainfleet, Tp.
Walkerton, Tn.
Walkerville, Tn.
Wallace, Tp.
Wallaceburg, Tn.
Walpole, Tp.
Walsingham N., Tp.
Walsingham S., Tp.
Wardsville, V.
Warwick, Tp.
Waterdown, V.
Waterford, V.
Waterloo, Tn.
Waterloo, Tp.
Waters, Tp.
Watford, V.
Watt, Tp.
Wawanosh E., Tp.
Wawanosh W., Tp.
Webbwood, Tn.
Welland, Tn.
Wellesley, Tp.
Wellington, V.
West Lorne, V.
Westmeath, Tp.
Westminster, Tp.
Weston, V.
Westport, V.
Whitby, Tn.
Whitby, Tp.
Whitby E., Tp.
Whitchurch, Tp.
Whitney, Tp.
Wiarton, Tn.
Wicklow, Tp.
Widdifield, Tp.
Wilberforce & Algona N., Tps.
Williams E., Tp.
Williams W., Tp.
Williamsburg, Tp.
Willoughby, Tp.
Wilmot, Tp.
Winchester, V.
Winchester, Tp.
Windham, Tp.
Windsor, C.
Wingham, Tn.
Wolfe Island, Tp.
Wolford, Tp.
Wollaston, Tp.
Wood, Tp.
Woodbridge, V.
Woodhouse, Tp.
Woodstock, C.
Woodville, V.
Woolwich, Tp.
Worthington & Blue. Tps.
Wroxeter, V.
Wylie, Tp.
Wyoming, V.

Yarmouth, Tp.
Yonge, Front, Tp.
Yonge and Escott, Rear, Tps.
York, Tp.

Zone, Tp.
Zorra E., Tp.
Zorra, W., Tp.

REPORTS FROM MUNICIPAL CLERKS

ABERDEEN, Tp.—See Macdonald, Meredith and Aberdeen Tps.

ABINGER, Tp.—See Denbigh, Abinger and Ashby Tps.

ACTON, V.—Owns and operates electric light plant, cost $8,500. Good opening for cheese and shoe factories. Number of buildings erected, 10; cost $2,000. Amount expended on sanitation, $200. Geo. Runnie, Village Clerk, Acton.

ADELAIDE, Tp.—Amount expended on permanent improvements, $2,000. Amount expended on sanitation, $120. Ambrose Topping, Township Clerk, Kerrwood.

ADJALA, Tp.—Good opening for woollen mill, blacksmith, milliner. No new buildings erected. Amount expended on permanent improvements, $5,000. Amount expended on sanitation, $100. Geo. H. Watson, Township Clerk, Athlone.

ADMASTON, Tp.—Number of buildings erected, 8; cost $6,500. Amount expended on permanent improvements, $5,237. R. W. Brown, Township Clerk, Admaston Station.

ADOLPHUSTOWN, Tp.—Good opening for canning factory. No new buildings erected. Amount expended on permanent improvements, $1,800. D. W. Roblin, Sillsville.

AILSA CRAIG, V.—Good opening for brick and tile yard. No new buildings erected. Amount expended on permanent improvements, $622. Amount expended on sanitation, $158. E. B. Smith, Village Clerk, Ailsa Craig.

ALBEMARLE, Tp.—Saw mill started. Owns and operates waterworks, cost $1,000. Good opening for planing mill. Number of buildings erected, 7; cost $10,000. Amount expended on permanent improvements, $2,325. Thos. Coveney, Township Clerk, Purple Valley.

ALBERTON Tp.—Saw mill started. Number of building erected, 3; cost about $3,000. Amount expended on permanent improvements, $718. F. H. Warner, Township Clerk, Fort Frances.

ALBION, Tp.—Number of buildings erected, 5; cost about $5,000. Amount expended on permanent improvements, $8,000. Robert Matson, Township Clerk, Palgrave.

ALDBOROUGH, Tp.—Number of buildings erected, 10; cost $10,000. Amount expended on permanent improvements, $13,000. E. A. Hugill, Township Clerk, Rodney.

ALEXANDRIA, Tn.—Owns and operates waterworks, cost $35,750; electric light plant, cost $11,750. Good openings for furniture factory, boot and shoe factory, ready made clothing, soap factory. Number of buildings erected, 5; cost $20,000. Amount expended on permanent improvements, $4,300. Amount expended on sanitation, $150. S. Macdonald, Town Clerk, Alexandria.

ALFRED, Tp.—Metal factory started. Number of buildings erected, 50; cost $15,000. Amount expended on permanent improvements, $437. B. G. Parisien, Township Clerk, Alfred.

ALGONA, N., Tp.—See Wilberforce and Algona N., Tps.

ALGONA S., Tp.—Number of buildings erected, 2; cost $200. Amount expended on permanent improvements, $60. P. Nelan, Township Clerk, Castile.

ALICE AND FRASER, Tps.—Owns and operates telephone system, cost $450. Number of buildings erected, 10; cost $4,500. Amount expended on permanent improvements, $267. J. M. Kennedy, Township Clerk, Pembroke.

ALLISON, Tn.—Show case factory started. Owns and operates waterworks, cost $27,000. Good openings for boot and shoe factory, woodenware factory, etc. Number of buildings erected, 8; cost $18,000. Amount expended on permanent improvements, $600. Amount expended on sanitation, $250. W. Lockhart, Town Clerk, Alliston.

ALMONTE, Tn.—Foundry started. Owns and operates electric light system, cost $40,000. Openings for industries requiring cheap power. Number of buildings erected, 15; cost $20,000. Amount expended on permanent improvements, $3,000. J. T. Kirkland, Town Clerk, Almonte.

ALNWICK, Tp.—Number of buildings erected, 17; cost $3,000. Amount expended on permanent improvements, $1,150; amount expended on sanitation, $70. J. McMillan, Township Clerk, Roseneath.

ALVISTON, V.—Good opening for sugar beet factory. No new buildings erected. Amount expended on permanent improvements, $878. Amount expended on sanitation, $378. John Irving, Village Clerk, Alviston.

AMABEL, Tp.—Brick works started. Number of buildings erected, 50; cost $25,000. Amount expended on permanent improvements, $1,000. R. H. Murray, Township Clerk, Allenford.

AMARANTH, Tp.—Number of buildings erected, 6; cost $7,100. Amount expended on permanent improvements, $5,200. E. Hamilton, Township Clerk, Laurel.

AMELIASBURG, Tp.—Canning factory started. Number of buildings erected, 5; cost $5,000. Amount expended on permanent improvements, $1,285. Amount expended on sanitation, $83. F. C. File, Township Clerk, Ameliasburg.

AMHERST ISLAND, Tp.—Number of buildings erected, 2; cost $2,200. Amount expended on permanent improvements, $756. W. H. Moutray, Township Clerk, Stella.

AMHERSTBURG, Tn.—Owns and operates waterworks, value $60,000; street lighting, value $4,500. Openings for industries of any character. Number of buildings erected, 8; cost $10,000. Amount expended on permanent improvements, $950. Amount expended on sanitation, $850. G. E. Pulford, Town Clerk, Amherstburg.

ANCASTER, Tp.—Number of buildings erected, 30; cost $125,000. Amount expended on permanent improvements, $4,508. Amount expended on sanitation, $216. Henry Pim, Township Clerk, Ancaster.

ANDERDON, Tp.—Good openings for factories of any description. Number of buildings erected, 17; cost $10,850. Amount expended on permanent improvements, $3,548. A. C. Mailloux, Township Clerk, Amherstburg.

ANGLESEA, Tp.—See Kaladar, Anglesea and Effingham Tps.

ANSON AND HINDON, Tp.—No new buildings erected. Amount expended on permanent improvements, $167. W. A. Welsh, Township Clerk, Minden.

ANSTRUTHER, Tp.—See Burleigh and Anstruther Tps.

APPLEBY, Tp.—See Casimer, Jennings and Appleby Tps.

ARKONA, V.—Good opening for cabinet factory, cement works, canning factory, crushing stone works. No new buildings erected. Amount expended on permanent improvements, $225. J. G. Brown, Village Clerk, Arkona.

ARMOUR, Tp.—Basket factory started. Number of buildings erected, 4; cost $8,000. F. Metcalf, Township Clerk, Burk's Falls.

ARNPRIOR, Tn.—Owns and operates waterworks, cost $94,000. Openings for all kinds of woodworking industries, grist mill, woollen mill, knitting factory, machine shop and foundry. Number of buildings erected, 7; cost $7,000. Amount expended on permanent improvements, $111,282. Amount expended on sanitation, $50,425. T. H. Grout, Town Clerk, Arnprior.

ARRAN, Tp.—Number of buildings erected, 6; cost $6,000. Amount expended on permanent improvements, $10,000. Amount expended on sanitation, $190. H. T. Potts, Township Clerk, Tara.

ARTEMESIA, Tp.—Good openings for various industries. Number of buildings erected, 10; cost $9,700. Amount expended on permanent improvements, $3,755. Amount expended on sanitation, $41. W. J. Bellamy, Township Clerk, Flesherton.

ARTHUR, V.—Egg farm, hennery and creamery started. Good openings for sugar beet factory, flax mill, tile yard, and various other industries. Number of buildings erected, 4; cost $5,000. Amount expended on permanent improvements, $900. Amount expended on sanitation. $68. D. T. Small, Village Clerk, Arthur.

ARTHUR, Tp.—Number of buildings erected, 4; cost $6,000. Amount expended on permanent improvements, $4,000. Albert Hellyer, Township Clerk, Kenilworth.

ASHBY, Tp.—See Denbigh, Abinger and Ashby Tps.

ASHFIELD, Tp.—Number of buildings erected, 10; cost $10,000. Amount expended on permanent improvements, $7,032. Amount expended on sanitation, $55. T. G. Allen, Township Clerk, Dungannon.

ASSIGINACK, Tp.—Openings for saw mill, shingle mill, sash and door factory. Number of buildings erected, 8; cost $8,000. Amount expended on permanent improvements, $3,500. Amount expended on sanitation, $50. R. W. Neilson, Township Clerk, Manitowaning.

ATHENS, V.—Good opening for mineral springs development. Number of buildngs erected, 2; cost $10,500. G. F. Donnelly, Village Clerk, Athens.

ATHOL, Tp.—Good opening for cement brick, etc. Number of buildings erected, 5; cost $4,000. Amount expended on permanent improvements, $449. W. Moore, Township Clerk, Picton.

ATWOOD, Tp.—Good opening for saw and pulp mills. No new buildings erected. Amount expended on permanent improvements, $487. D. Arbuckle, Rainy River.

AUGUSTA, Tp.—Number of buildings erected, 4; cost $7,000. Amount expended on permanent improvements, $5,972. Amount expended on sanitation, $300. John Mellafont, Algonquin.

AWENGA, Tp.—See Korah and Parks Tps.

AYLMER, Tn.—Owns and operates electric light system, cost $30,000; waterworks, cost $100,000. Openings for all kind of industries. Number of buildings erected, 10; cost $51,000. Amount expended on permanent improvements, $60,000. Amount expended on sanitation, $4,000. D. C. Davis, Town Clerk, Aylmer.

AYR, V.—Owns and operates electric light plant, cost $8,000. Good openings for any kinds of industries. Number of buildings erected, 2; cost $5,000. Amount expended on permanent improvements, $415. Amount expended on sanitation, $500. A. J. Reid, Village Clerk, Ayr.

BAGOT AND BLYTHFIELD, Tps.—Good opening for box factory, pulp factory, etc. Number of buildings erected, 6; cost $6,000. Amount expended on permanent improvements, $1,200. Amount expended on sanitation, $25. J. J. Dillon, Township Clerk, Calabogie.

BALFOUR, Tp.—Openings for industries of any character. Number of buildings erected, 3; cost $1,200. Amount expended on permanent improvements, $2,000. J. A. Bastien, Township Clerk, Chelmsford.

BANCROFT, V.—Good opening for planing mill, sash and door factory, grist and chopping mill. No new buildings erected. W. A. Davy, Village Clerk, Bancroft.

BANGOR, Tp.—Good opening for chemical works, woodworking industries. Number of buildings erected, 50; cost $4,000. Amount expended on permanent improvements, $758. Amount expended on sanitation, $150. John Perry, Township Clerk, Maynooth.

Barrie, Tn.—Owns and operates waterworks, cost $121,854; electric light plant, cost $90,452. Good openings for industries of any character. Number of buildings erected, 56; cost $176,000. Amount expended on permanent improvements, $30,000. Amount expended on sanitation, $12,000. E. Donnell, Town Clerk, Barrie.

Barrie, Tp.—No new buildings erected. Amount expended on permanent improvements, $150. W. P. Maynard, Township Clerk, Cloyne.

Barton, Tp.—Good openings for industries of any character. Number of buildings erected, 30; cost $30,000. Amount expended on permanent improvements, $57,642. Amount expended on sanitation, $1,555. A. G. E. Bryant, Township Clerk, Mount Hamilton.

Bastard and Burgess S., Tps.—One new building erected, cost $2,500. Amount expended on permanent improvements, $6,654. Amount expended on sanitation, $251. W. J. Birch, Township Clerk, Delta.

Bath, V.—General store started. Owns and operates street lighting plant, cost $225. Good opening for canning factory. Number of buildings erected, 2; cost $1,800. Amount expended on permanent improvements, $473. E. P. Shephard, Village Clerk, Bath.

Bathurst, Tp.—Good openings for milk condensing and woodworking plants. Number of buildings erected, 12; cost $1,500. Amount expended on permanent improvements, $750. Amount expended on sanitation, $50. R. M. Anderson, Township Clerk, Perth.

Bayfield, V.—Owns and operates rural telephone system, cost $1,385. Good openings for flax mill, canning factory, sash and door factory. Number of buildings erected, 7; cost $2,000. Amount expended on permanent improvements, $575. H. W. Erwin, Village Clerk, Bayfield.

Bayham, Tp.—Canning factory started. Good openings for carriage works, creamery and canning factory. Number of buildings erected, 8; cost $25,000. Amount expended on permanent improvements, $200. B. Brian, Township Clerk, Straffordville.

Beamsville, V.—Cement block works started. Owns and operates waterworks, cost $27,000. Good openings for canning factory, grape wine factory. Number of buildings erected, 17; cost $22,000. Amount expended on permanent improvements, $1,600. W. D. Fairbrother, Village Clerk, Beamsville.

Beaverton, V.—Owns and operates hydro-electric power, cost $10,000. Good openings for various industries. Number of buildings erected, 2; cost $3,000. Amount expended on permanent improvements, $1,069. Amount expended on sanitation, $714. C. A. Paterson, Village Clerk, Beaverton.

Beckwith, Tp.—Number of buildings erected, 3; cost $3,000. Amount expended on permanent improvements, $1,000. J. W. Robertson, Township Clerk, Carleton Place.

Bedford, Tp.—Butter factory started. Owns and operates telephone system, cost $1,000. Good opening for blacksmith. Number of buildings erected, 5; cost $4,000. Amount expended on permanent improvements, $2,000. James McNeil, Township Clerk, Burridge.

Beeton, V.—Owns and operates waterworks, cost $20,000; electric light plant, cost $4,000. Good opening for sash and door factory. One new building erected, cost $1,000. Amount expended on permanent improvements, $500. Amount expended on sanitation, $100. Joseph Wright, Village Clerk, Beeton.

Belle River, V.—Number of buildings erected, 7; cost $3,100. Amount expended on permanent improvements, $497. Alfred La Charite, Village Clerk, Belle River.

Belleville, C.—Owns and operates waterworks, value $206,111; gas plant, value $90,069. Openings for industries of any character. Number of buildings erected, 400; cost $400,000. Amount expended on permanent improvements, $6,000. Amount expended on sanitation, $2,500. J. W. Holmes, City Clerk, Belleville.

Belmont and Methuen, Tps.—Number of buildings erected, 4; cost $2,000. Amount expended on permanent improvements, $2,090. W. H. Johnston, Township Clerk, Havelock.

Bentinck, Tp.—Number of buildings erected, 10; cost $15,000. Amount expended on permanent improvements, $5,100. Amount expended on sanitation, $210. J. H. Chittick, Township Clerk, Lamlash.

Berlin, C.—Felt factory, shoe factory, tile factory, forge factory started. Owns and operates waterworks, cost $318,759; gas and electric light plant, cost $479,317; street railway, $138,374. Good openings for all kinds of industries, especially iron industries. Number of buildings erected, 271; cost $651,871. Amount expended on permanent improvements, $200,000. Amount expended on sanitation, $35,000. A. H. Miller, City Clerk, Berlin.

Bertie, Tp.—Stone quarry started. Good opening for various industries. Number of buildings erected, 63; cost $60,000. Amount expended on permanent improvements, $6,969. Amount expended on sanitation, $231. M. S. Pound, Township Clerk, Ridgeway.

Beverly, Tp.—Number of buildings erected, 7; cost $8,700. Amount expended on permanent improvements, $7,698. W. Wood, Township Clerk, Rockton.

Bexley, Tp.—Good opening for lime kiln industry. One new building erected, cost $400. Amount expended on permanent improvements, $1,200. Alfred Taylor, Township Clerk, Victoria Road.

Biddulph, Tp.—Good opening for brick and tile factory. Number of buildings erected, 15; cost $15,000. Amount expended on permanent improvements, $6,620. Amount expended on sanitation, $59. W. D. Stanley, Township Clerk, Granton.

Billings, Tp.—Good opening for woodworking industry. One new building erected, cost $800. Amount expended on permanent improvements, $1,500. W. M. Boyd, Township Clerk, Kagawong.

Binbrook, Tp.—Number of buildings erected, 4; cost $10,000. Amount expended on permanent improvements, $3,202. W. B. Switzer, Township Clerk, Glanford Station.

Blandford, Tp.—Good openings for canning factory, creamery, milk condenser, apple evaporator. Amount expended on permanent improvements, $3,513. Amount expended on sanitation, $106. George Oliver, Township Clerk, Bright.

Blanshard, Tp.—Number of buildings erected, 3; cost $8,000. Amount expended on permanent improvements, $7,338. J. H. Jameson, Township Clerk, Rannoch.

Blenheim, Tn.—Canning factory started. Owns and operates electric light plant, cost $12,000. Good openings for industries of any description. Number of buildings erected, 4; cost $10,000. Amount expended on permanent improvements, $1,500. P. S. Shillington, Town Clerk, Blenheim.

Bleinheim, Tp.—Good openings for industries of any character. Number of buildings erected, 8; cost $11,000. Amount expended on permanent improvements, $8,155. Hugh Allan, Township Clerk, Drumbo.

Blezard, Tp.—Good opening for butter factory. Number of buildings erected, 5; cost $800. Amount expended on permanent improvements, $154. G. Bonin, Township Clerk, Blezard Valley.

Blind River, Tn.—Box factory started. Openings for furniture factory, tannery, pulp mill. Number of buildings erected, 2; cost $21,000. M. F. Dyke, Town Clerk, Blind River.

Bloomfield, V.—Good opening for condensed milk factory. No new buildings erected. Amount expended on permanent improvements, $100. C. H. Saylor, Village Clerk, Bloomfield.

Blue, Tp.—Number of buildings erected, 2; cost $1,800. Amount expended on permanent improvements, $1,527. H. Engebretsen, Township Clerk, Sleeman.

Blyth, V.—Owns and operates electric light plant and waterworks for fire protection, cost $12,000; municipal telephone system, cost $32,000. Amount expended on permanent improvements, $300. Amount expended on sanitation, $2,000. A. Elder, Village Clerk, Blyth.

Blythfield, Tp.—See Bagot and Blythfield Tps.

Bobcaygeon, V.—Saw mill started. Owns and operates electric light plant, cost $25,000. Good openings for woodworking industries. Number of buildings erected, 6; cost $5,500. Amount expended on permanent improvements, $900. C. E. Stewart, Village Clerk, Bobcaygeon.

Bolton, V.—Good opening for steam laundry. Number of buildings erected, 2; cost $5,000. Amount expended on sanitation, $100. John McDonald, Village Clerk, Bolton.

Bonfield, Tn.—Good openings for saw mill, woollen factory, furniture factory, flour mill. Number of buildings erected, 3; cost $1,150. Amount expended on permanent improvements, $106. L. A. St. Cyr, Town Clerk, Bonfield.

Bonfield, Tp.—Saw mill started. Good openings for grist mill, stave mill, lath and shingle mill, sash and door factory, brick yard, carbide factory. Number of buildings erected, 16; cost $20,000. Amount expended on permanent improvements, $1,600. M. R. Dunn, Township Clerk, Rutherglen.

Bosanquet, Tp.—Number of buildings erected, 8; cost $7,400. Amount expended on permanent improvements, $9,593. Geo. Sutherland, Township Clerk, Thedford.

Bothwell, Tn.—Owns and operates waterworks, cost $4,500; electric light plant, cost $6,000. Good opening for canning factory. Number of buildings erected, 2; cost $2,000. Amount expended on permanent improvements, $1,350. Amount expended on sanitation, $300. W. H. Bradley, Town Clerk, Bothwell.

Bowmanville, Tn.—Good openings for any kind of manufacturing industries. Number of buildings erected, 26; cost $50,000. Amount expended on permanent improvements, $3,500. Amount expended on sanitation, $1,500. John Lyle, Town Clerk, Bowmanville.

Bracebridge, Tn.—Owns and operates waterworks, cost $60,000; electric light and power plant, cost $120,000. Good openings for woodworking industries of every description. Number of buildings erected, 4; cost $13,000. Amount expended on permanent improvements, $4,000. Amount expended on sanitation, $500. A. C. Salmon, Town Clerk, Bracebridge.

Bradford, V.—Good openings for industries of any character. Number of buildings erected, 3; cost $5,500. Amount expended on permanent improvements, $1,000. Geo. G. Green, Village Clerk, Bradford.

Brampton, Tn.—Boot and shoe factory, foundry started. Owns and operates waterworks, cost $125,000; electric light plant, cost $80,000. Openings for all kinds of industries. Number of buildings erected, 50; cost $125,000. Amount expended on permanent improvements, $25,000. Amount expended on sanitation, $6,000. W. H. McFadden, Town Clerk, Brampton.

Brant, Tp.—No new buildings erected. Amount expended on permanent improvements, $2,000. M. A. McCallum, Township Clerk, Elmwood.

Brantford, C.—Piano case factory, athletic goods factory, sporting goods factory started. Owns and operates waterworks, cost $619,179; street railway, cost $270,000. Good openings for various industries. Number of buildings erected, 594; cost, $1,015,886. Amount expended on permanent improvements, $60,000. Amount expended on sanitation, $124,065. H. F. Leonard, City Clerk, Brantford.

Brantford, Tp.—Brick works started. Good opening for industries requiring electric power. Number of buildings erected, 55; cost $55,000. Amount expended on permanent improvements, $15,988. J. A. Smith, Township Clerk, Brantford.

Bridgeburg, V.—Iron works started. Owns and operates waterworks, cost $40,000. Number of buildings erected, 15; cost $25,000. Amount expended on permanent improvements, $10,000. Amount expended on sanitation, $8,000. R. A. Land, Village Clerk, Bridgeburg.

Brighton, V.—Owns and operates waterworks, cost $50,000. Good openings for various industries. Number of buildings erected, 3; cost $6,000. Amount expended on permanent improvements, $1,000. A. Marks, Village Clerk, Brighton.

Brighton, Tp.—Evaporator started. Owns and operates telephone system, cost $16,000. Number of buildings erected, 8; cost $7,000. Amount expended on permanent improvements, $3,888. Amount expended on sanitation, $279. F. A. Wade, Township Clerk, Brighton.

Brock, Tp.—Number of buildings erected, 4; cost $10,000. Amount expended on permanent improvements, $7,745. Amount expended on sanitation, $243. Frank Doble, Township Clerk, Sunderland.

Brockville, Tn.—Owns and operates waterworks, cost $265,587; gas and electric plant, cost $235,364. Good openings for various industries. Number of buildings erected, 28; cost $68,400. Amount expended on permanent improvements, $33,850. Amount expended on sanitation, $10,605. G. K. Dewey, Town Clerk, Brockville.

Bromley, Tp.—Good openings for industries of any character. Number of buildings erected, 4; cost $6,000. Amount expended on permanent improvements, $2,300. J. D. Walsh, Township Clerk, Cobden.

Brooke, Tp.—Owns and operates telephone system, cost $20,000. Opening for brick and tile yard. Number of buildings erected, 7; cost $12,000. Amount expended on permanent improvements, $8,864. Amount expended on sanitation, $37. W. G. Willoughby, Township Clerk, Watford.

Brougham, Tp.—Good opening for mining industries. Number of buildings erected, 3; cost $1,200. Michael Sheedy, Township Clerk, Mount St. Patrick.

Bruce, Tp.—Good opening for summer resorts on Lake Huron. Amount expended on permanent improvements, $8,223. J. G. MacKay, Township Clerk, Underwood.

Bruce Mines, Tn.—Good opening for saw mill. One new building erected, cost $1,600. Amount expended on permanent improvements, $800. Thos. Sullivan, Town Clerk, Bruce Mines.

Brudenell and Lynedoch, Tps. Number of buildings erected, 40; cost $28,000. Amount expended on permanent improvements, $143. T. L. O'Grady, Township Clerk, Brudenell.

Brunel, Tp.—Good openings for saw mills, shingle mills, wood working factories. Number of buildings erected, 4; cost $2,000. Amount expended on permanent improvements, $644. H. Farnsworth, Township Clerk, Huntsville.

Bruton, Tp.—See Dysart, etc., Tps.

Brussels, V.—Owns and operates telephone system, cost $45,000. Good openings for various industries. No new buildings erected. Amount expended on sanitation, $2,000. F. S. Scott, Village Clerk, Brussels.

Buchanan, Tp.—See Rolph, Buchanan and Wylie, Tps.

Bucke, Tp.—Good opening for brick yard, lumber mills, pulp mills. Number of buildings erected, 25; cost $15,000. Amount expended on permanent improvements, $5,000. H. A. Day, Township Clerk, Haileybury.

Burford, Tp.—Number of buildings erected, 14; cost $15,000. Amount expended on permanent improvements, $11,455. Amount expended on sanitation, $100. F. W. Taylor, Township Clerk, Burford.

Burgess, N., Tp.—No new buildings erected. Amount expended on permanent improvements, $275. R. T. Noonan, Township Clerk, Stanleyville.

Burgess S., Tp.—See Bastard and Burgess S., Tps.

Burk's Falls, V.—Owns and operates waterworks, cost $37,000. Good openings for furniture factory and woodworking industries. Number of buildings erected 3; cost $3,000. Amount expended on permanent improvements, $761. C. McArthur, Village Clerk, Burk's Falls.

Burleigh and Anstruther, Tps.—Number of buildings erected, 2; cost $1,000. Amount expended on permanent improvements, $130. W. Gallon, Township Clerk, Apsley.

Burlington, V.—Owns and operates waterworks, cost $60,000. Good openinge for industries of any character. Number of buildings erected, 40; cost $90,000. Amount expended on permanent improvements, $15,000. Amount expended on sanitation, $4,067. J. S. Allen, Village Clerk, Burlington.

Burns, Tp.—See Sherwood, Jones and Burns Tps.

Burpee, Tp.—No new buildings erected. Amount expended on permanent improvements, $355. Norman Bailey, Township Clerk, Evansville.

Cache Bay, Tn.—Good opening for sash and door factory. One new building erected, cost $800. Amount expended on permanent improvements, $644. Amount expended on sanitation, $28. R. Bain, Town Clerk, Cache Bay.

Caister, Tp.—Number of buildings erected, 6; cost $4,000. Amount expended on permanent improvements, $2,000. Amount expended on sanitation, $47. Albert Shields, Township Clerk, Canfield.

Caldwell, Tp.—Number of buildings erected, 6; cost $3,000. Amount expended on permanent improvements, $2,584. E. Beaudoin, Township Clerk, Verner.

Caledon, Tp.—Tile and brick works started. Opening for industries of any character. Number of buildings erected, 3; cost $8,000. Amount expended on permanent improvements, $5,721. L. H. Willis, Township Clerk, Belfountain.

Caledonia, V.—Machine repairing shop started. Owns and operates electric light system, cost $5,000. Good opening for knitting factory. Number of build-

ings erected, 25: cost $50,000. Amount expended on permanent improvements, $1,200. Amount expended on sanitation, $200. J. W. Aven, Village Clerk, Caledonia.

CALEDONIA, Tp.—Number of buildings erected, 10; cost $10,000. Amount expended on sanitation, $800. R. L. Downing, Township Clerk, Routhier.

CALVIN, Tp.—Amount expended on permanent improvements, $79. D. Adams, Township Clerk, Galston.

CAMBRIDGE, Tp.—Number of buildings erected, 11; cost $5,000. Amount expended on permanent improvements, $7,130. J. B. Sanche, Township Clerk, Casselman.

CAMDEN, Tp.—No new buildings erected. Amount expended on permanent improvements, $4,500. M. S. Blackburn, Township Clerk, Dresden.

CAMDEN E., Tp.—Number of buildings erected. 7: cost $10,000. Amount expended on permanent improvements, $3,700. T. E. McGill, Township Clerk, Centreville.

CAMERON, Tp.—Good openings for saw mill. pulp mill. No new buildings erected. Amount expended on sanitation. $40. S. J. McMeekin, Township Clerk, Mattawa.

CANBOROUGH, Tp.—Brick works started. Number of buildings erected, 6; cost $10,000. Amount expended on permanent improvements, $1,449. M. E. Shaver, Township Clerk, Canborough P.O.

CANNINGTON, V.—Good openings for various industries. Number of buildings erected, 3; cost $3,500. Amount expended on permanent improvements, $400. W. A. Robinson, Village Clerk, Cannington.

CANONTO N., Tp.—See Palmerston and N. and S. Canonto Tps.

CANONTO, S., Tp.—See Palmerston and N. and S. Canonto Tps.

CARADOC, Tp.—Owns and operates telephone system, cost $16,000. Good opening for canning factory. Number of buildings erected, 10; cost $14,000. Amount expended on permanent improvements. $11,301. Amount expended on sanitation, $305. F. A. Lockwood, Township Clerk, Mount Brydges.

CARDEN, Tp.—Number of buildings erected, 2; cost $500. Amount expended on permanent improvements, $606. John Walsh, Township Clerk, Kerkfield.

CARDIFF, Tp.—Good openings for saw mill and woodworking industries. No new buildings erected. Amount expended on permanent improvements, $104. A. G. Tate, Township Clerk, Highland Grove.

CARDINAL, V.—Number of buildings erected. 3: cost $2,500. Amount expended on permanent improvements. $1,027. Amount expended on sanitation. $175. M. Kavanagh, Village Clerk. Cardinal.

CARDWELL, Tp.—Saw mill started. One new building erected, cost $600. Amount expended on permanent improvements, $175. M. Wilson, Township Clerk, Rosseau.

CARLETON PLACE, Tn.—Good openings for industries of any character. Number of buildings erected. 5; cost $30,000. Amount expended on permanent improvements, $4,517. Amount expended on sanitation. $72,000. A. R. G. Peden, Town Clerk, Carleton Place.

CARLING, Tp.—Canadian explosives factory started. Good opening for tannery and woodworking industries. No new buildings erected. J. D. Broughton, Township Clerk, Parry Sound.

CARLOW, Tp.—Openings for industries of any character. Number of buildings erected, 4; cost $2,000. Amount expended on permanent improvements, $1,000. Amount expended on sanitation, $25. J. E. Greaves, Township Clerk, Fort Stewart.

Carnarvon, Tp.—No new buildings erected. Amount expended on permanent improvements, $1,950. W. Vincer, Township Clerk, Mindemoya.

Carrick, Tp.—Good opening for furniture factory, etc. Number of buildings erected, 15; cost $60,000. Amount expended on permanent improvements, $6,000. Amount expended on sanitation, $50. J. A. Johnston, Township Clerk, Mildmay.

Cartwright, Tp.—Number of buildings erected, 3; cost $2,000. Amount expended on permanent improvements, $1,628. Amounts expended on sanitation, $27. W. Beacock, Township Clerk, Caesarea.

Cashel, Tp.—See Tudor Tp.

Casselman, V.—Owns and operates fire engine, cost $5,000. Number of buildings erected, 5; cost $9,400. Amount expended on permanent improvements, $948. Amount expended on sanitation, $123. Joseph Martin, Village Clerk, Casselman.

Cassimer, Jennings and Appleby, Tps.—Number of buildings erected, 4; cost $1,300. Amount expended on permanent improvements, $1,600. Amount expended on sanitation, $450. Wilfrid Laforge, Township Clerk, St. Charles.

Cavan, Tp.—Veneer factory started. Number of buildings erected, 23; cost $18,000. Amount expended on permanent improvements, $7,058. Amount expended on sanitation, $53. J. N. McGill, Township Clerk, Millbrook.

Cavendish, Tp.—See Galway and Cavendish, Tps.

Cayuga, V.—Rubber goods factory started. Number of buildings erected, 6; cost $15,000. Amount expended on permanent improvements, $1,789. J. W. Sheppard, Village Clerk, Cayuga.

Cayuga N., Tp.—Number of buildings erected, 12; cost 12,000. Amount expended on permanent improvements, $2,800. W. Teasdale, Township Clerk, Cayuga.

Cayuga S., Tp.—Number of buildings erected, 5; cost $3,000. Amount expended on permanent improvements, $200. Amount expended on sanitation, $6. J. W. Caughell, Township Clerk, South Cayuga.

Chaffey, Tp.—Brick yard started. Openings for woodworking industries. Number of buildings erected, 11; cost $6,500. Amount expended on permanent improvemnts, $2,102. J. H. Silverwood, Township Clerk, Huntsville.

Chamberlain, Tp.—Good openings for pulp mills, flour barrel factory. Number of buildings erected, 3; cost $1,000. George Dickinson, Township Clerk, Englehart.

Chandos, Tp.—Owns and operates telephone system, value $3,000. Good opening for mining and woodworking industries. Number of buildings erected, 4; cost $1,150. Amount expended on permanent improvements, $142. Amount expended on sanitation, $2. L. P. Bullied, Township Clerk, Lasswade.

Chapleau, Tp.—Owns and operates waterworks, value $48,000. Number of buildings erected, 50; cost $69,000. Amount expended on permanent improvements, $1,082. Amount expended on sanitation, $294. J. T. Smart, Township Clerk, Chapleau.

Chapman, Tp.—Good opening for woollen mills. No new buildings erected. Amount expended on permanent improvements, $1,996. H. Q. Snuggs, Township Clerk, Magnetawan.

Chapple, Tp.—Good openings for cheese and butter factory, grist mill. Amount expended on permanent improvements, $3,478. J. A. McNabb, Township Clerk, Barwick.

Charlottenburg, Tp.—Openings for industries requiring water power. Number of buildings erected, 10; cost $10,000. Amount expended on permanent improvements, $10,000. G. A. Watson, Township Clerk, Williamstown.

CHARLOTTEVILLE, Tp.—Good openings for industries requiring water power or natural gas. Number of buildings erected, 6; cost $10,500. Amount expended on permanent improvements, $2,638. Amount expended on sanitation, $4,250. R. W. McCall, Township Clerk, Vittoria.

CHATHAM, C.—Owns and operates waterworks, value $238,458; street lighting plant, value $40,000. Openings for canning factory, pickle factory, beet sugar factory, or any industry requiring cheap fuel, cheap water, and good labour conditions. Number of buildings erected, 151; cost $338,310. Amount expended on permanent improvements, $46,289. Amount expended on sanitation, $11,126. W. D. Merritt, City Clerk, Chatham.

CHATHAM, Tp.—Good openings for tile yards and machinery, fruit evaporator. Number of buildings erected, 10; cost $12,000. Amount expended on permanent improvements, $1,500. A McArthur, Township Clerk, Tupperville.

CHATSWORTH, V.—No new buildings erected. Amount expended on permanent improvements, $547. Amount expended on sanitation, $21. W. G. Reilly, Village Clerk, Chatsworth.

CHELMSFORD, Tn.—Good openings for cheese and butter factories, grist mill, woodworking industries. Number of buildings erected, 5; cost $5,000. H. J. Gratton, Town Clerk, Chelmsford.

CHESLEY, Tn.—Owns and operates waterworks, cost $48,000. Good openings for stove foundry, whitewear factory, etc. One new building erected, cost $300. Amount expended on permanent improvements, $1,000. Amount expended on sanitation, $120. H. S. Sanderson, Town Clerk, Chesley.

CHESTERVILLE, V.—Owns and operates electric light plant, cost $5,000. Good openings for woodworking plant, milk condensing plant. Number of buildings erected, 2; cost $3,500. Amount expended on permanent improvements, $3,358. Amount expended on sanitation, $67. George Elliott, Village Clerk, Chesterville.

CHINGUACOUSY, Tp.—Owns and operates telephone system, cost $30,000. Number of buildings erected, 6; cost $7,000. Amount expended on permanent improvements, $5,000. Robert Kee, Township Clerk, Cheltenham.

CHISHOLM, Tp.—Good openings for butter and cheese factory, brick and concrete plant, woollen mill, sash and door factory, planing mill and blacksmith. Number of buildings erected, 4; cost $2,400. Amount expended on permanent improvements, $772. Edward Topps, Township Clerk, Alderdale.

CHIPPAWA, V.—Owns and operates street lighting plant, cost $1,050. Good openings for industries of any description. Number of buildings erected, 3; cost $3,500. Amount expended on permanent improvements, $600. Charles Weinbrenner, Village Clerk, Chippawa.

CHRISTIE, Tp.—Good openings for factories requiring hardwood. One new building erected, cost $500. W. Thompson, Township Clerk, Orrville.

CLARA, Tp.—See Head, Maria and Clara Tps.

CLARENCE, Tp.—Number of buildings erected, 100; cost $50,000. Amount expended on sanitation, $1,005. J. A. Menard, Township Clerk, Bourget.

CLAREDON AND MILLER, Tps.—Number of buildings erected, 2; cost $750. Amount expended on permanent improvements, $700. Amount expended on sanitation, $100. J. F. Card, Township Clerk, Plevna.

CLARKE, Tp.—Canning factory started. Number of buildings erected, 12; cost $40,000. Amount expended on permanent improvements, $7,250. Amount expended on sanitation, $144. John Rickaby, Township Clerk, Orono.

Clifford, V.—Owns and operates acetylene gas lighting plant, cost $3,500. Good opening for woodworking factories. Number of buildings erected, 3; cost $27,200. Amount expended on permanent improvements, $640. J. R. Aitchison, Village Clerk, Clifford.

Clinton, Tn.—Player piano factory started. Owns and operates waterworks, cost $62,000; electric light plant, cost $33,000. Openings for industries of any character. Number of buildings erected, 2; cost $2,000. Amount expended on permanent improvements, $2,115. D. L. Macpherson, Town Clerk, Clinton.

Clinton, Tp.—Good opening for basket factory or canning factory. Number of buildings erected, 13; cost $14,900. Amount expended on permanent improvements, $7,000. G. W. Tinlin, Township Clerk, Beamsville.

Clyde, Tp.—See Dysart, etc., Tps.

Cobalt, Tn.—Owns and operates waterworks and sewage system, value $101,108. Good opening for temperance hotel. Number of buildings erected, 56; cost $91,400. Amount expended on permanent improvements, $37,842. Amount expended on sanitation, $8,041. R. L. O'Gorman, Town Clerk, Cobalt.

Cobden, V.—Good opening for repair shop for agricultural machinery. Number of buildings erected, 3; cost $4,000. Amount expended on permanent improvements, $300. J. R. Warren, Village Clerk, Cobden.

Cobourg, Tn.—Washing machine factory started. Openings for industries of any character. Number of buildings erected, 29; cost $39,550. Amount expended on permanent improvements, $3,172. Amount expended on sanitation, $3,170. B. Ewing, Town Clerk, Cobourg.

Cochrane, Tn.—Planing mill, sash and door factory and railway machine shop started. Owns and operates waterworks, cost $90,000. Good openings for brick factory, milling, pulp and paper industry. Number of buildings erected, 15; cost $50,000. Amount expended on permanent improvements, $1,100. Amount expended on sanitation, $11,500. H. J. Brown, Town Clerk, Cochrane.

Cockburn Island, Tp.—Good openings for brick yard, lime kiln, stone quarries, cement and saw mills. Number of buildings erected, 2; cost $800. Amount expended on permanent improvements, $458. D. J. McLeod, Township Clerk, Cockburn Island.

Colborne, Tp.—Amount expended on permanent improvements, $2,000. R. McIlwain, Township Clerk, Nile.

Colborne, V.—Canning factory started. Good openings for industries of any character. Number of buildings erected, 4; cost $15,000. Amount expended on permanent improvements, $1,815. Geo. Keyes, Village Clerk, Colborne.

Colchester, N., Tp.—Owns and operates telephone system, cost $11,836. Good opening for brick and tile yard, excelsior factory, creamery. Number of buildings erected, 15; cost $34,000. Amount expended on permanent improvements, $8,049. L. C. Hillis, Township Clerk, Gesto.

Colchester S., Tp.—Canning factory started. Good openings for canning factory, overall factory. Number of buildings erected, 14; cost $18,100. Amount expended on permanent improvements, $3,914. Amount expended on sanitation, $12. J. H. Madill, Township Clerk, Harrow.

Coldwater, V.—Owns and operates waterworks, cost $23,000. Openings for industries of any character. No new buildings erected. Amount expended on permanent improvements, $1,177. Howard Chester, Village Clerk, Coldwater.

Coleman, Tp.—No new buildings erected. Amount expended on permanent improvements, $59,699. Amount expended on sanitation, $340. P. J. Hart, Township Clerk, Cobalt.

Collingwood, Tn.—Owns and operates waterworks, cost $74,373; electric light plant, cost $51,425. Good opening for woodworking industry. Number of buildings erected, 11, cost $33,850. Amount expended on permanent improvements, $6,000. Amount expended on sanitation, $1,400. J. H. Duncan, Town Clerk, Collingwood.

Collingwood, Tp.—Owns and operates waterworks, cost $7,000. Good opening for industries requiring good water power. No new buildings erected. Amount expended on permanent improvements, $6,187. E. Rorke, Township Clerk, Thornbury.

Conmee, Tp.—Number of buildings erected, 15; cost $7,500. Amount expended on permanent improvements, $1,660. R. Pifer, Township Clerk, Kokobeca Falls.

Copper Cliff, Tn.—Number of buildings erected, 13; cost $81,000. Amount expended on permanent improvements, $1,890. Amount expended on sanitation, $2,846. J. W. Gallagher, Town Clerk (acting), Copper Cliff.

Cornwall, Tn.—Owns and operates waterworks, cost $150,000. Good openings for industries of any character requiring power. Number of buildings erected, 25; cost $25,000. Amount expended on permanent improvements, $10,000. J. G. Harkness, Town Clerk, Cornwall.

Cornwall, Tp.—Good opening for various industries. Number of buildings erected, 5; cost $7,000. Amount expended on permanent improvements, $6,000. Amount expended on sanitation, $580. John Mullin, Township Clerk, Mille Roches.

Courtright, V.—Salt factory started. Good openings for various industries. One new building erected, cost $1,200. Amount expended on permanent improvements, $800. R. G. Stewart, Village Clerk, Courtright.

Cramahe, Tp.—Good opening for canning factory. Number of buildings erected, 5; cost $3,050. Amount expended on permanent improvements, $4,152. Amount expended on sanitation, $115. C. A. Wilson, Township Clerk, Castleton.

Creemore, V.—Owns and operates waterworks, cost $25,000. One new building erected, cost $500. Amount expended on permanent improvements, $9,000. A. H. Watson, Village Clerk, Creemore.

Crosby, N., Tp.—One new building erected, cost $1,000. Amount expended on permanent improvements, $860. Amount expended on sanitation, $35. W. McKnight, Township Clerk, Westport.

Crosby, S., Tp.—Number of buildings erected, 4; cost $2,000. Amount expended on permanent improvements, $2,561. J. R. Dargavel, Township Clerk, Elgin.

Crowland, Tp.—Openings for industries of any character. Number of buildings erected, 50; cost $75,000. Amount expended on permanent improvements, $6,213. Amount expended on sanitation, $900. H. L. Pratt, Township Clerk, Welland.

Crozier, Tp.—See Alberton Tp.

Culross, Tp.—Owns and operates telephone system, cost $3,360. Number of buildings erected, 5; cost $7,300. Amount expended on permanent improvements, $3,143. Amount expended on sanitation, $39. Chas Button, Township Clerk, Teeswater.

Cumberland, Tp.—Good opening for a tinsmith, blacksmith, bricklayer, saw mill, boot and shoe factory, stove foundry, glass factory. Number of buildings erected, 31; cost $26,000. Amount expended on permanent improvement's $4,000. W. W. Dunning, Township Clerk, Cumberland.

Dalhousie and Sherbrooke, N., Tp.—Good opening for any industry requiring hardwood lumber. Number of buildings erected, 10; cost $4,000. Amount expended on permanent improvements, $1,313. W. Geddes, Township Clerk, Dalhousie Lake.

Dalton, Tp.—Number of buildings erected, 2; cost $1,600. Amount expended on permanent improvements, $600. B. Nicholson, Township Clerk, Sebright.

Darling, Tp.—Good opening for mining industries. No new buildings erected. Amount expended on permanent improvements, $212. Amount expended on sanitation, $52. T. D. King, Township Clerk, Tatlock.

Darlington, Tp.—Opening for canning factory. No new buildings erected. Amount expended on permanent improvements, $7,540. Amount expended on sanitation, $24. W. Allin, Township Clerk, Hampton.

Dawn, Tp.—Owns and operates telephone system, cost $12,000. Number of buildings erected, 7; cost $10,000. Amount expended on permanent improvements, $4,000. J. M. Webster, Township Clerk, Rutherford.

Day and Bright (Additional), Tps.—Good opening for cheese factory and creamery. Number of buildings erected, 3; cost $600. Chas. Cavanagh, Township Clerk, Sowerby.

Delaware, Tp.—Chopping mill started. Good opening for harness shop. Number of buildings erected, 5; cost $10,000. Amount expended on permanent improvements, $5,313. Amount expended on sanitation, $200. J. H. Matthews, Township Clerk, Delaware.

Delhi, V.—Openings for industries requiring cheap electrical power or natural gas. Number of buildings erected, 9; cost $30,000. Amount expended on permanent improvements, $1,514. Amount expended on sanitation, $69. R. Chrysler, Village Clerk, Delhi.

Denbigh, Abinger and Ashby, Tps.—Number of buildings erected, 4; cost $1,200. Amount expended on permanent improvements, $227. P. Stein, Township Clerk, Denbigh.

Denison, Tp.—See Drury, Denison and Graham Tps.

Derby, Tp.—Number of buildings erected, 4; cost $4,000. Amount expended on permanent improvements, $5,726. Amount expended on sanitation, $172. W. Beaton, Township Clerk, Owen Sound.

Dereham, Tp.—No new buildings erected. Amount expended on permanent improvements, $14,897. Amount expended on sanitation, $339. A Bell, Township Clerk, Mount Elgin.

Deseronto, Tn.—Owns and operates waterworks, cost $48,300; gas works, cost $19,000. Good openings for all industries, particularly those requiring large supplies of raw materials in bulk, steel and iron working industries, etc., wood pulp and paper mills, cement works, textiles, smallwares of all kinds. Excellent opening for summer hotel. Number of buildings erected, 3; cost $6,500. Amount expended on permanent improvements, $1,616. Amount expended on sanitation, $1,219. H. R. Bedford, Town Clerk, Deseronto.

Digby, Tp.—See Laxton, Digby and Longford Tps.

Dilke, Tp.—Number of buildings erected, 2; cost $500. Amount expended on permanent improvements, $1,108. A. A. Snider, Township Clerk, Pinewood.

Dorchester, N., Tp.—Good opening for canning factory, condensed milk factory. Number of buildings erected, 20; cost $29,800. Amount expended on permanent improvements, $3,300. Amount expended on sanitation, $100. W. B. Lane, Township Clerk, Dorchester Station.

Dorchester, S., Tp.—Good openings for canning factory, furniture factory, hardware store, boot and shoe store. Number of buildings erected, 8; cost $8,000. Amount expended on permanent improvements, $6,000. D. Taylor, Township Clerk, Belmont.

Douro, Tp.—Number of buildings erected, 8; cost $8,200. Amount expended on permanent improvements, $1,018. Amount expended on sanitation, $38. F. D. Leahy, Township Clerk, Lakefield.

Dover, Tp.—Owns and operates telephone system, cost $3,500. Number of buildings erected, 12; cost $10,200. Amount expended on permanent improvements, $2,435. Amount expended on sanitation, $200. John Welsh, Township Clerk, Chatham.

Downie, Tp.—Number of buildings erected, 6; cost $7,200. Amount expended on permanent improvements, $11,900. Amount expended on sanitation, $342. D. Smith, Township Clerk, Stratford.

Draper, Tp.—One new building erected, cost $600. Amount expended on permanent improvements, $1,400. D. Cairns, Township Clerk, Uffington.

Drayton, V.—Hockey stick mill, saw and planing mill and excelsior started. Good opening for brick factory. One new building erected, cost $500. Amount expended on permanent improvements, $1,079. Amount expended on sanitation, $20. A. C. Woodman, Village Clerk, Drayton.

Dresden, Tn.—Owns and operates waterworks, cost $16,900; electric light plant, cost $15,000. Openings for industries of any character. One new building erected, cost $6,000. Amount expended on permanent improvements, $2,092. Amount expended on sanitation, $303. J. T. Bridgwater, Town Clerk, Dresden.

Drummond, Tp.—Number of buildings erected, 5; cost $6,000. Amount expended on sanitation, $40. E. R. Stedman, Township Clerk, Perth.

Drury, Denison and Graham, Tps.—Nickel mine started. Number of buildings erected, 17; cost $50,000. Amount expended on permanent improvements, $1,282. Amount expended on sanitation, $1,294. F. E. Loney, Township Clerk, Worthington.

Dryden, Tn.—Cement brick and block plant started. Good openings for photographer, veterinary, music store, flour mill, sash and door factory. Number of buildings erected, 3; cost $10,000. Amount expended on permanent improvements, $199. Amount expended on sanitation, $106. Ira J. Wilde, Town Clerk, Dryden.

Dudley, Tp.—See Dysart, etc., Tps.

Dumfries, N., Tp.—Number of buildings erected, 8; cost $10,000. Amount expended on permanent improvements, $1,620. Joseph Wrigley, Township Clerk, Ayr.

Dumfries, S., Tp.—Fire protection, $3,000. Number of buildings erected, 8; cost $20,000. Amount expended on permanent improvements, $5,610. Amount expended on sanitation, $91. H. S. Mans, Township Clerk, Paris.

Dummer, Tp.—No new buildings erected. Amount expended on permanent improvement, $1,121. Amount expended on sanitation, $38. R. Deen, Township Clerk, Warsaw.

Dungannon, Tp.—Marble quarry started. Good opening for mines. Number of buildings erected, 2; cost $1,000. Amount expended on permanent improvements, $900. John Lumb, Township Clerk, L'Amable.

Dundalk, V.—Owns and operates electric light plant, cost $8,000. Good openings for furniture factory, planing mill and woollen mill. One new building

erected, cost $1,000. Amount expended on permanent improvements, $500. Amount expended on sanitation, $1,500. M. W. Ridley, Village Clerk, Dundalk.

DUNDAS, Tn.—Lumber and concrete industries started. Owns and operates waterworks, cost $71,163; electric light plant, cost $35,530. Good openings for industries of any character. Number of buildings erected, 101; cost $208,010. Amount expended on permanent improvements, $9,227. Amount expended on sanitation, $1,065. J. S. Fry, Town Clerk, Dundas.

DUNN, Tp.—Good openings for lime kiln, brick kiln, tile kiln. Number of buildings erected, 2; cost $4,000. Amount expended on permanent improvements, $200. O. Dichhout, Township Clerk, Byng.

DUNNVILLE, Tn.—Owns and operates waterworks, cost $57,297. Good opening for iron works. Number of buildings erected, 54; cost $92,300. Amount expended on permanent improvements, $21,796. J. W. Holmes, Town Clerk, Dunnville.

DUNWICH, Tp.—Number of buildings erected, 5; cost $10,000. Amount expended on permanent improvements, $5,500. D. A. McNabb, Township Clerk, Dutton.

DURHAM, Tn.—Good openings for small industries. Number of buildings erected, 8; cost $4,450. Amount expended on permanent improvements, $830. W. B. Vollet, Town Clerk, Durham.

DUTTON, V.—Saw mill started. Good opening for canning factory, basket factory. Number of buildings erected, 4; cost $7,000. Amount expended on permanent improvements, $150. J. D. Blue, Village Clerk, Dutton.

DYMOND, Tp.—Good opening for stave factory. No new buildings erected. Amount expended on permanent improvements, $4,087. E. F. Stephenson, Township Clerk, Dutton.

DYSART, etc., Tps.—Owns and operates street lighting system, cost $500. Good openings for lumber mills, stave factory, furniture factory, etc. Number of buildings erected, 25; cost $12,500. G. H. Potts, Township Clerk, Haliburton.

EASTHOPE, N., Tp.—Owns and operates telephone system, cost $24,000. Number of buildings erected, 15; cost $8,500. Amount expended on permanent improvements, $4,555. J. D. Fisher, Township Clerk, Amulree.

EASTHOPE, S., Tp.—Repair shop started. Number of buildings erected, 2; cost $7,000. Amount expended on permanent improvements, $2,482. V. Stock, Township Clerk, Tavistock.

EASTNOR, Tp.—Number of buildings erected, 6; cost $4,700. Amount expended on permanent improvements, $2,614. E. Brooks, Township Clerk, Lion's Head.

EASTVIEW, Tn.—Carpet cleaning factory started. Good opening for factories of all kinds. Number of buildings erected, 35; cost $210,000. H. R. Washington, Town Clerk, Cummings Bridge.

EDWARDSBURG, Tp.—Good opening for brick and tile yard. Number of buildings erected, 30; cost $4,000. Amount expended on permanent improvements, $4,694. Amount expended on sanitation, $46. M. McGuire, Township Clerk, Spencerville.

EFFINGHAM, Tp.—See Kaladar, Anglesea and Effingham Tps.

EGANVILLE, V.—Good opening for knitting mill, pulp mill, box factory, etc. Number of buildings erected, 7; cost $15,000. Amount expended on permanent improvements, $6,000. Hugh Costello, Village Clerk, Eganville.

EGREMONT, Tp.—Saw mill started. Good opening for harness shop. Number of buildings erected, 4; cost $4,000. Amount expended on permanent improvements, $3,302. Amount expended on sanitation, $163. D. Allan, Township Clerk, Holstein.

EKFRID, Tp.—Number of buildings erected, 6; cost $9,000. Amount expended on permanent improvements, $2,250. A. P. McDougald, Township Clerk, Melbourne.

ELDERSLIE, Tp.—Number of buildings erected, 12; cost $14,000. Amount expended on permanent improvements, $9,947. Amount expended on sanitation, $99. R. C. Pearce, Township Clerk, Paisley.

ELDON, Tp.—Number of buildings erected, 15; cost $14,000. Amount expended on permanent improvements, $4,000. B. Stacey, Township Clerk, Lorneville.

ELIZABETHTOWN, Tp.—Number of buildings erected, 15; cost $37,000. Amount expended on permanent improvements, $10,283. Amount expended on sanitation, $108. J. S. Webster, Township Clerk, Bellamy's.

ELLICE, Tp.—Good opening for harness maker. Number of buildings erected, 27; cost $10,300. Amount expended on permanent improvements, $5,529. Amount expended on sanitation, $128. J. Kreuter, Township Clerk, Rostock.

ELMA, Tp.—Good openings for sash and door factory and condensed milk factory. Number of buildings erected, 12; cost $16,000. Amount expended on permanent improvements, $4,200. Amount expended on sanitation, $210. G. Lochhead, Township Clerk, Atwood.

ELMIRA, V.—Owns and operates waterworks, cost $3,500; electric light plant, cost $2,000. Openings for industries of any character. Number of buildings erected, 20; cost $40,000. Amount expended on permanent improvements, $2,800. J. H. Ruppel, Village Clerk, Elmira.

ELMSLEY, N., Tp.—Number of buildings erected, 2; cost $1,800. Amount expended on permanent improvements, $800. Amount expended on sanitation, $65. Roy Darow, Township Clerk, Perth.

ELMSLEY S., Tp.—Good opening for baker. One new building erected, cost $100. Amount expended on permanent improvements, $528. J. Rabb, Township Clerk, Lombardy.

ELORA, V.—Textile industry started. One new building erected, cost $1,500. Amount expended on permanent improvements, $450. H. Clarke, Village Clerk, Elora.

ELZEVIR AND GRIMSTHORPE, Tps.—Number of buildings erected, 2; cost $2,000. Amount expended on permanent improvements, $1,113. W. J. Rhodes, Township Clerk, Queensboro.

EMBRO, V.—Good openings for condenser, brick yard, creamery, furniture factory. No new buildings erected. Amount expended on permanent improvements, $350. E. J. Cody, Village Clerk, Embro.

EMILY, Tp.—Number of buildings erected, 4; cost $5,000. Amount expended on permanent improvements, $3,661. R. J. Grandy, Township Clerk, Omemee.

EMO, Tp.—Good opening for bank, grist mill. Number of buildings erected, 10; cost $12,000. Amount expended on permanent improvements, $4,522. D. Strachan, Township Clerk, Emo.

ENGLEHART, Tn.—Good openings for sash and door factory, grist mill. Number of buildings erected, 5; cost $20,500. Amount expended on permanent im-

provements, $600. Amount expended on sanitation, $100. F. Hugh, Town Clerk, Englehart.

ENNISKILLEN, Tp.—No new buildings erected. Amount expended on permanent improvements, $7,000. G. V. Wyant, Township Clerk, Petrolea.

ENNISMORE, Tp.—Saw mill started. Number of buildings erected, 20; cost $10,000. Amount expended on permanent improvements, $800. John Maloney, Township Clerk, Ennismore.

ERAMOSA, Tp.—Owns and operates electric lighting plant, cost $6,000. Good openings for various industries. Number of buildings erected, 21; cost $20,000. Amount expended on permanent improvements, $6,982. Amount expended on sanitation, $360. W. M. Head, Township Clerk, Guelph.

ERIN, V.—Number of buildings erected, 4; cost $10,000. Amount expended on permanent improvements, $1,000. W. Conboy, Village Clerk, Erin.

ERIN, Tp.—Good opening for creamery. Number of buildings erected, 10; cost $10,000. Amount expended on permanent improvements, $1,000. Amount expended on sanitation, $74. Peter McLaren, Township Clerk, Hillsburgh.

ERNESTTOWN, Tp.—Amount expended on permanent improvements, $4,773. Amount expended on sanitation, $271. E. O. Clark, Township Clerk, Odessa.

ESCOTT FRONT, Tp.—No new buildings erected. Amount expended on permanent improvements, $200. E. Kelly, Township Clerk, Mallorytown.

ESCOTT REAR, Tp.—See Yonge and Escott Rear Tps.

ESQUESSING, Tp.—Brick factory started. Good openings for cheese factory, canning factory, creamery. Number of buildings erected, 20; cost $25,000. Amount expended on permanent improvements, $12,000. J. A. Tracy, Township Clerk, Esquessing.

ESSA, Tp.—Saw mill started. Opening for basket factory. Number of buildings erected, 5; cost $3,000. Amount expended on permanent improvements, $7,433. Amount expended on sanitation, $96. John Coxworth, Township Clerk, Thornton.

ESSEX, Tn.—Owns and operates waterworks, cost $35,000. Good openings for industries of any character. Number of buildings erected, 6; cost $9,000. Amount expended on permanent improvements, $8,000. R. R. Brett, Town Clerk, Essex.

ETOBICOKE, Tp.—Good openings for industries of any character. Number of buildings erected, 100; cost $200,000. Amount expended on permanent improvements, $15,000. S. Barratt, Township Clerk, Islington.

EUPHEMIA, Tp.—Number of buildings erected, 2; cost $1,800. Amount expended on permanent improvements, $2,822. D. M. Smith, Township Clerk, Cairo.

EUPHRASIA, Tp.—Owns and operates telephone system, cost $15,000. Number of buildings erected, 5; cost $10,000. Amount expended on permanent improvements, $4,800. N. L. Curry, Township Clerk, Rocklyn.

EVANTUREL, Tp.—Good opening for saw mills. Number of buildings erected, 5; cost $2,000. Amount expended on permanent improvemets, $2,134. Amount expended on sanitation, $25. P. T .Broome, Township Clerk, Heaslip.

EXETER, V.—Machinery works started. Owns and operates waterworks, cost $28,234. Good openings for woollen mill and tannery. Number of buildings erected, 14; cost $18,000. Amount expended on permanent improvements, $4,317. Amount expended on sanitation, $406. T. B. Carling, Village Clerk, Exeter.

EYRE, Tp.—See Dysart, etc., Tps.

Faraday, Tp.—No new buildings erected. Amount expended on permanent improvements, $1,000. W. Davy, Township Clerk, Bancroft.

Fenelon Falls, V.—Owns and operates electric light plant; cost $53,131. Good openings for various industries. Number of buildings erected, 3; cost, $4,400. Amount expended on permanent improvements, $1,500. E. Fitzgerald, Village Clerk, Fenelon Falls.

Fenelon, Tp.—Lumber mills started. Number of buildings erected, 15; cost $16,200. Amount expended on permanent improvements, $2,059. J. B. Powles, Township Clerk, Powles' Corners.

Fergus, V.—Owns and operates waterworks, cost $38,000; electric light and power plant, cost $16,000. Good opening for farm implements factory, cement industries, furniture factory, stove foundry, knitting factory, woollen factory. Number of buildings erected, 25; cost $40,000. Amount expended on permanent improvements, $3,817. Amount expended on sanitation, $200. James Beattie, Village Clerk, Fergus.

Ferris, Tp.—Good opening for cheese factory and brickyard. Number of buildings erected, 21; cost $12,700. Amount expended on permanent improvements, $333. Amount expended on sanitation, $85. S. Moreau, Township Clerk, Corbeil.

Finch, V.—Number of buildings erected, 2; cost $7,000. Amount expended on permanent improvements, $525. J. W. Carr, Village Clerk, Finch.

Finch, Tp.—Good opening for industries of any character. Number of buildings erected, 7; cost $10,000. Amount expended on permanent improvements, $7,986. Amount expended on sanitation, $455. D. B. Cameron, Township Clerk, Berwick.

Fitzroy, Tp.—Owns and operates electric light plant, cost $60,000; telephone, system, cost $25,000. Good opening for woollen mill. Number of buildings erected, 8; cost $12,900. Amount expended on permanent improvements, $2,500. A. Murphy, Township Clerk, Antrim.

Flamborough, E., Tp.—Number of buildings erected, 9; cost $25,600. Amount expended on permanent improvements, $9,000. Amount expended on sanitation, $208. George Church, Township Clerk, Waterdown.

Flamborough, W., Tp.—Number of buildings erected, 5; cost $7,500. Amount expended on permanent improvements, $5,200. Amount expended on sanitation, $986. Ira N. Binckley, Township Clerk, Greensville.

Flesherton, V.—Good opening for foundry, furniture factory, etc. One new building erected, cost $1,500. Amount expended on permanent improvements, $458. W. H. Thurston, Village Clerk, Flesherton.

Flos, Tp.—Owns and operates telephone system, cost $25,000. Good openings for woollen mill, foundry, flax mill, brick and tile industry. No new buildings erected. Amount expended on permanent improvements, $3,000. C. S. Burton, Township Clerk, Elmvale.

Foley, Tp.—Good opening for furniture factory and summer hotel. No new buildings erected. Amount expended on permanent improvements, $1,184. Andrew Oastler, Township Clerk, James Bay Junction.

Ford City, V.—Electric automobile factory, stamping and auto lamp works started. Good opening for automobile accessories. Number of buildings erected, 10; cost $20,000. Amount expended on permanent improvements, $16,563. Amount expended on sanitation, $1,660. J. S. Foster, Village Clerk, Ford.

Forest, Tn.—Owns and operates electric light plant, cost $39,000. Openings for jam factory, pickle factory, handle factory, box factory. Number of buildings erected, 12; cost $21,900. Amount expended on permanent improvements, $2,129. Amount expended on sanitation, $32. Richard Karr, Town Clerk, Forest.

Fort Erie, V.—Novelty industry and cocoa factory started. Owns and operates waterworks, cost $60,000; street lighting plant, cost $4,000. Openings for any manufacturing industry except planing mills and sash and door factories. Number of buildings erected, 7; cost $18,000. Amount expended on permanent improvements, $7,083. W. Simmons, Village Clerk, Fort Erie.

Fort Frances, Tn.—Owns and operates waterworks, cost $91,319; electric light plant, cost $21,547. Good opening for woodworking industry. Number of buildings erected, 101; cost $220,000. Amount expended on permanent improvements, $17,749. Amount expended on sanitation, $12,117. J. W. Walker, Town Clerk, Fort Frances.

Fort William, C.—Wire nails and wire products factory, pressed brick factory, iron and steel pipe factory, elevators started. Owns and operates waterworks, cost $959,500; electric light plant, cost $197,150; telephone system, cost $259,000; street railway, cost $874,000. Splendid opening for all wholesale and distributing warehouses. Number of buildings erected, 400; cost, $4,000,000. Amount expended on permanent improvements, $200,000. Amount expended on sanitation, $125,000. A. McNaughton, City Clerk, Fort William.

Fraser, Tp.—See Alice and Fraser Tps.

Fredericksburgh, N., Tp.—Number of buildings erected, 3; cost $3,200. Amount expended on permanent improvements, $610. Amount expended on sanitation, $51. M. A. Sills, Township Clerk, Napanee.

Fredericksburgh, S., Tp.—Good openings for blacksmith, canning factory, creamery. Number of buildings erected, 4; cost $3,500. Amount expended on permanent improvements, $1,067. G. T. Ham, Township Clerk, Conway.

Fullarton, Tp.—Number of buildings erected, 8; cost $11,700. Amount expended on permanent improvements, $6,000. R. H. Pomeroy, Township Clerk, Fullarton.

Gainsborough, Tp.—Good openings for industries requiring electric power. Number of buildings erected, 8; cost $14,500. Amount expended on permanent improvements, $500. Amount expended on sanitation, $25. S. W. Freure, Township Clerk, Wellandport.

Galt, Tn.—Owns and operates waterworks, cost $276,355; electric light plant, $136,000. Openings for iron industries, woollen mills, or any industries requiring electric power. Number of buildings erected, 256; cost $523,014. Amount expended on permanent improvements, $40,950. Amount expended on sanitation, $41,564. J. McCartney, Town Clerk, Galt.

Galway and Cavendish, Tps.—One new building erected, cost $700. Amount expended on permanent improvements, $320. P. Collins, Township Clerk, Mount Irwin.

Gananoque, Tn.—Owns and operates waterworks, cost $150,000. Good opening for industries of any character. Number of buildings erected, 12; cost $83,850. Amount expended on permanent improvements, $3,812. Amount expended on sanitation, $71. S. McCammon, Town Clerk, Gananoque.

Garafraxa, E., Tp.—Good opening for blacksmith. Amount expended on permanent improvements, $16,000. Amount expended on sanitation, $25. John Preston, Township Clerk, Marsville.

GARAFRAXA, W., Tp.—Number of buildings erected, 3; cost, $5,500. Amount expended on permanent improvements, $500. James Campbell, Township Clerk, Belwood.

GARDEN ISLAND, V.—No new buildings erected. Amount expended on permanent improvements, $446. B. H. Williams, Village Clerk, Garden Island.

GARSON, Tp.—See Neelon and Garson Tps.

GEORGETOWN, V.—Glove factory started. Owns and operates waterworks, cost $50,000; electric light plant, cost $17,000. Good opening for industries of any character. Number of buildings erected, 20; cost $55,000. Amount expended on permanent improvements, $8,000. Amount expended on sanitation, $100. H. W. Kennedy, Village Clerk, Georgetown.

GEORGINA, Tp.—Number of buildings erected, 7; cost $10,000. Amount expended on permanent improvements, $6,501. Donald Ego, Township Clerk, Virginia.

GLAMORGAN, Tp.—Good opening for marble, granite stone quarries, graphite and iron. Number of buildings erected, 4; cost $1,125. Amount expended on permanent improvements, $500. J. A. Hargreaves, Gooderham.

GLANFORD, Tp.—Number of buildings erected, 8; cost $15,000. Amount expended on permanent improvements, $1,400. Amount expended on sanitation, $31. D. Reed, Township Clerk, Mount Hope.

GLENCOE, V.—Canning factory started. Owns and operates electric light plant, cost $11,000. Good openings for furniture factory and condensed milk factory. Number of buildings erected, 9; cost $12,800. Amount expended on permanent improvements, $800. Amount expended on sanitation, $400. George Wilson, Village Clerk, Glencoe.

GLENELG, Tp.—Number of buildings erected, 2; cost $1,000. Amount expended on permanent improvements, $5,067. Amount expended on sanitation, $147. J. S. Black, Township Clerk, Priceville.

GLOUCESTER, Tp.—The village of Rockcliffe owns and operates waterworks system, cost $5,000. Number of buildings erected, 2; cost $1,359. Amount expended on permanent improvements, $6,000. Amount expended on sanitation, $500. H. B. Billings, Township Clerk, Billing's Bridge.

GODERICH, Tn.—Owns and operates waterworks and electric light plant, cost $125,956. Good openings for all kinds of industries. Number of buildings erected, 21; cost $58,000. Amount expended on permanent improvements, $5,207. Amount expended on sanitation, $2,088. L. L. Knox, Town Clerk, Goderich.

GODERICH, Tp.—Owns and operates telephone system, cost $12,000. Good opening for fruit and poultry farming. Number of buildings erected, 9; cost $13,500. Amount expended on permanent improvements, $2,000. N. W. Trewartha, Township Clerk, Holmesville.

GORDON, Tp.—Good opening for saw mill, grist mill, cheese factory. Number of buildings erected, 5; cost $2,050. Amount expended on permanent improvements, $1,300. J. Gibson, Township Clerk, Foxey.

GORE BAY, Tn.—Owns and operates telephone system, cost $2,500. Good opening for box or chair factory. One new building erected, cost $1,000. Amount expended on permanent improvements, $1,028. F. W. Major, Town Clerk, Gore Bay,

GOSFIELD, N., Tp.—Canning factory started. Owns and operates telephone system, cost $18,850. Opening for tobacco factory, canning factory. Number of

buildings erected, 12; cost $17,600. Amount expended on sanitation, $30. W. H. Noble, Township Clerk, Cottam.

Gosfield, S., Tp.—Cold storage plant started. Number of buildings erected, 36; cost $46,850. Amount expended on permanent improvements, $6,630. G. W. Coatsworth, Township Clerk, Kingsville.

Goulburn, Tp.—Number of buildings erected, 4; cost $3,325. Amount expended on permanent improvements, $3,785. Amount expended on sanitation, $68. J. A. Cummings, Township Clerk, Hazledean.

Gower, N., Tp.—Number of buildings erected, 5; cost $6,500. Amount expended on permanent improvements, $9,300. Amount expended on sanitation, $56. J. E. Craig, Township Clerk, North Gower.

Gower, S., Tp.—No new buildings erected. Amount expended on permanent improvements, $1,131. E. Pelton, Township Clerk, Kemptville.

Graham, Tp.—See Drury, Denison and Graham Tps.

Grand Valley, V.—Good opening for any kind of industry. Number of buildings erected, 2; cost $3,500. Amount expended on permanent improvements, $310. Amount expended on sanitation, $16. J. A. Richardson, Village Clerk, Grand Valley.

Grantham, Tp.—Canning factory started. Good openings for industries of any character. Number of buildings erected, 25; cost $100,000. Amount expended on permanent improvements, $10,377. Amount expended on sanitation, $15. L. S. Bessey, Township Clerk, St. Catharines.

Grattan, Tp.—Good opening for pulp mill. Number of buildings erected, 4; cost $8,000. Amount expended on permanent improvements, $300. Amount expended on sanitation, $100. John George, Township Clerk, Eganville.

Gravenhurst, Tn.—Owns and operates waterworks, cost $30,000. Electric light plant, cost $90,000. Good openings for any kind of industries. No new buildings erected. Amount expended on permanent improvements, $1,000. W. H. Cross, Town Clerk, Gravenhurst.

Greenock, Tp.—Number of buildings erected, 3; cost $5,000. Amount expended on permanent improvements, $6,233. T. H. Purdy, Township Clerk, Narva.

Grey, Tp.—Number of buildings erected, 2; cost $7,000. Amount expended on permanent improvements, $7,099. A. H. Macdonald, Township Clerk, Ethel.

Griffith and Matawatchan, Tps.—Good openings for furniture and woodworking factories, mining, etc. One new building erected, cost $510. Amount expended on permanent improvements, $350. A. Legree, Township Clerk, Khartum.

Grimsby, N., Tp.—Number of buildings erected, 5; cost, $11,000. Amount expended on permanent improvements, $5,413. Amount expended on sanitation, $128. T. W. Allan, Township Clerk, Winona.

Grimsby, S., Tp.—Number of buildings erected, 3; cost $1,500. Amount expended on permanent improvements, $3,435. F. W. Roberts, Township Clerk, Smithville.

Grimsthorpe, Tp.—See Elzevir Tps.

Guelph, C.—Planing mill, malleable iron foundry, casket factory started. Owns and operates waterworks, cost $365,368; gas and electric light plant, cost $363,553; street railway, cost $336,978. Good opening for agricultural implement factory, furniture factory, etc. Number of buildings erected, 172; cost

$357,335. Amount expended on permanent improvements, $34,475. Amount expended on sanitation, $12,000. T. J. Moore, City Clerk, Guelph.

Guelph, Tp.—Good openings for various industries. Number of buildings erected, 13; cost $315,000. Amount expended on permanent improvements, $5,936. J. Laidlaw, Township Clerk, Guelph.

Guildford, Tp.—See Dysart, etc., Tps.

Gwillimbury, E., Tp.—Number of buildings erected, 6; cost $12,000. Amount expended on permanent improvements, $4,000. A. R. Mackenzie, Township Clerk, Queensville.

Gwillimbury, N., Tp.—Number of buildings erected, 18; cost $21,000. Amount expended on permanent improvements, $4,500. F. S. Van Norman, Township Clerk, Keswick.

Gwillimbury, W., Tp.—One new building erected, cost $1,400. Amount expended on permanent improvements, $1,069. Amount expended on sanitation, $94. E. J. Evans, Township Clerk, Bradford.

Hagar, Tp.—No new buildings erected. Amount expended on permanent improvements, $99. J. Brown, Township Clerk, Markstay.

Hagarty and Richards, Tps.—Good opening for cheese factory and brickyard. Number of buildings erected, 4; cost $1,000. Amount expended on permanent improvements, $606. P. Lavelle, Township Clerk, Rochefort.

Hagarman, Tp.—Saw mills started. Number of buildings erected, 6; cost $3,600. Amount expended on permanent improvements, $600. Amount expended on sanitation, $50. F. N. Macfie, Township Clerk, Dunchurch.

Hagersville, V.—Owns and operates electric light and power plant, cost $8,000. Good opening for canning factory. Number of buildings erected, 8; cost $20,000. Amount expended on permanent improvements, $1,000. J. T. Park, Village Clerk, Hagersville.

Haileybury, Tn.—Owns and operates waterworks, cost $134,733. Good openings for woodworking or pulp and paper mills. Number of buildings erected, 7; cost $15,000. Amount expended on permanent improvements, $2,952. Amount expended on sanitation, $2,257. T. H. Connor, Town Clerk, Haileybury.

Haldimand, Tp.—Number of buildings erected, 40; cost $50,000. Amount expended on permanent improvements, $8,000. Amount expended on sanitation, $116. R. Lawless, Township Clerk, Grafton.

Hallam, Tp.—Good opening for cheese factory or creamery. Number of buildings erected, 4; cost $1,500. Amount expended on permanent improvements, $4,000. J. H. Toland, Township Clerk, Webbwood.

Hallowell, Tp.—Good opening for pickle and vinegar factory. Number of buildings erected, 5; cost, $2,650. Amount expended on permanent improvements, $1,818. E. B. Yarwood, Township Clerk, Picton.

Hamilton, C.—Saw works, eversharp pencil factory, mantle and refrigerator factory, greenhouse construction factory, stereotyping and electrotyping factory, jam factory, ovens factory started. Owns and operates waterworks, cost $3,651,156; electric light plant, cost $560,000. Good opening for any industries using iron and steel for their raw materials. Number of buildings erected, 2,019; cost $5,110,000. Amount expended on permanent improvements, $774,145. Amount expended on sanitation, $229,169. S. H. Kent, City Clerk, Hamilton.

Hamilton, Tp.—Owns and operates telephone system, cost $2,000. Number of buildings erected, 2; cost $2,000. Amount expended on permanent improve-

ments, $13,425. Amount expended on sanitation, $152. J. D. Stewart, Township Clerk, Cobourg.

HANMER, Tp.—Number of buildings erected, 4; cost $500. Amount expended on permanent improvements, $1,029. L. T. Carriere, Township Clerk, Hanmer.

HANOVER, Tn.—Foundry and machine shop started. Owns and operates waterworks; cost $35,350. Good openings for woollen mills, rubber factory, boots and shoes, stove foundry, agricultural implements, sash and door factory, carriage and wagon works, sheet metal and tinware, piano factory, refrigerator factory, and screen doors and windows. Number of buildings erected, 75; cost $125,000. Amount expended on permanent improvements, $4,025. J. Taylor, Town Clerk, Hanover.

HARBURN, Tp.—See Dysart, etc., Tps.

HARCOURT, Tp.—See Dysart, etc., Tps.

HARLEY, Tp.—Good opening for creamery and cheese factory. Number of buildings erected, 3; cost $4,000. Amount expended on permanent improvements, $3,300. Amount expended on sanitation, $60. E. Cragg, Township Clerk, Hanbury.

HARRIS, Tp.—Number of buildings erected, 19; cost $3,500. Amount expended on permanent improvements, $2,881. F. Wilson, Township Clerk, New Liskeard.

HARRISTON, Tn.—Owns and operates waterworks, cost $35,000; electric light plant, cost $11,000. Good opening for knitting and shirt factory. Number of buildings erected, 2; cost $6,000. Amount expended on permanent improvements, $600. A. J. Stewart, Town Clerk, Harriston.

HARROW, Tp.—See Salter, May and Harrow Tps.

HARVEY, Tp.—Openings for any industries requiring wood and stone. No new buildings erected. Amount expended on permanent improvements, $991. D. Weir, Township Clerk, Peterborough.

HARWICH, Tp.—Number of buildings erected, 13; cost $20,000. Amount expended on permanent improvements, $14,000. G. W. Riseborough, Township Clerk, Blenheim.

HASTINGS, V.—Good openings for industries of any character. One new building erected, cost $1,500. Amount expended on permanent improvements, $500. A. Wilson, Village Clerk, Hastings.

HAVELOCK, V.—Good openings for creamery, canning factory, woollen mill, woodenware factory. Number of buildings erected, 4; cost $11,000. Amount expended on sanitation, $2,253. E. Fennell, Village Clerk, Havelock.

HAVELOCK, Tp.—See Dysart, etc., Tps.

HAWKESBURY, Tn.—Sash and door factory, board and paper mills started. Owns and operates waterworks, cost $135,000. Good openings for marble factory, mica works, carriage factory, saw mills, etc. Number of buildings erected, 35; cost $1,575,000. Amount expended on permanent improvements, $1,500. Amount expended on sanitation, $50,100. E. R. Paquette, Town Clerk, Hawkesbury.

HAWKESBURY E., Tp.—Openings for various industries. Number of buildings erected, 15; cost $10,000. Amount expended on permanent improvements, $8,362. N. Labrosse, Township Clerk, St. Eugene.

HAWKESBURY W., Tp.—Good opening for lime and brick yard. Number of buildings erected, 20; cost $15,000. Amount expended on permanent improvements, $1,600. W. I. Dunning, Township Clerk, Vankleek Hill.

Hay, Tp.—Clothing factory started. Owns and operates telephone system, cost $20,000. Good openings for canning factory, brick and tile yard. One new building erected, cost $1,000. Amount expended on permanent improvements, $7,014. F. Hess, Township Clerk, Zurich.

Head, Maria and Clara, Tps.—Good openings for industries requiring water power. No new buildings erected. Amount expended on permanent improvements, $800. W. G. Jackson, Township Clerk, Deux Rivieres.

Hensall, V.—No new buildings erected. Amount expended on permanent improvements, $400. A. Murdock, Village Clerk, Hensall.

Hepworth, V.—Good opening for woodenware factory. No new buildings erected. Amount expended on permanent improvements, $183. W. R. White, Village Clerk, Hepworth.

Hespeler, Tn.—Stamp and enamel works started. Owns and operates electric light plant, cost $29,219. Number of buildings erected, 4; cost $18,000. Amount expended on permanent improvements, $4,320. M. E. Jardine, Town Clerk, Hespeler.

Herschel, Tp.—See Monteagle and Herschel Tps.

Hibbert, Tp.—No new buildings erected. Amount expended on permanent improvements, $6,580. Amount expended on sanitation, $409. James Jordan, Township Clerk, Dublin.

Hilliard, Tp.—Openings for pulp mill, creameries, cheese factories. No new buildings erected. Amount expended on permanent improvements, $1,701. C. Wood, Township Clerk, Hilliardton.

Hillier, Tp.—Number of buildings erected, 6; cost $8,700. Amount expended on permanent improvements, $1,862. P. Wilson, Township Clerk, Hillier.

Hilton, Tp.—Number of buildings erected, 3; cost $1,500. Amount expended on permanent improvements, $1,605. W. E. Whybourne, Township Clerk, Marksville.

Himsworth N., Tp.—Good openings for tannery, chemical works, saw mill, planing mill. Number of buildings erected, 4; cost $4,500. Amount expended on permanent improvements, $1,521. J. R. Moon, Township Clerk, Callender.

Himsworth S., Tp.—Number of buildings erected, 6; cost $2,700. Amount expended on permanent improvements, $300. R. Ferguson, Township Clerk, Powassan.

Hinchinbrooke, Tp.—Good opening for cheese box factory. Number of buildings erected, 15; cost $18,000. Amount expended on permanent improvements, $3,300. G. A. Smith, Township Clerk, Parham.

Hindon, Tp.—See Anson and Hindon Tps.

Holland, Tp.—Good openings for furniture factory, sash and door factory, cement factory, canning factory. No new buildings erected. Amount expended on permanet improvements, $2,613. Amount expended on sanitation, $214. J. P. Hare, Township Clerk, Holland Centre.

Holland Landing, V.—Chopping mill started. Good openings for various industries. No new buildings erected. Amount expended on permanent improvements, $485. F. J. Sheppard, Village Clerk, Holland Landing.

Hope, Tp.—Good opening for canning factory. Number of buildings erected, 5; cost $5,500. Amount expended on permanent improvements, $7,208. Amount expended on sanitation, $180. T. Roberts, Township Clerk, Welcome.

Horton, Tp.—Number of buildings erected, 4; cost $4,200. Amount expended on permanent improvements, $1,200. E. J. Stewart, Township Clerk, Renfrew.

Houghton, Tp.—Good opening for blacksmith. One new building erected, cost $1,400. Amount expended on permanent improvements, $2,560. Amount expended on sanitation, $68. W. V. Stevenson, Township Clerk, Houghton.

Howard, Tp.—Good opening for creamery or cheese factory. No new buildings erected. G. McDonald, Township Clerk, Ridgetown.

Howe Island, Tp.—Number of buildings erected, 3; cost $1,000. Amount expended on permanent improvements, $300. James Leavis, Township Clerk, Howe Isalnd.

Howick, Tp.—Owns and operates telephone system, cost $6,273; gas plant, cost $1,600. No new buildings erected. Amount expended on permanent improvements, $7,779. Amount expended on sanitation, $99. C. E. Walker, Township Clerk, Gorrie.

Howland, Tp.—Good opening for stone crushing plant, woollen mill. Number of buildings erected, 2; cost $1,500. Amount expended on permanent improvements, $2,000. J. Bateman, Township Clerk, Sheguindah.

Hudson, Tp.—Good opening for butter factory. Number of buildings erected-7; cost $4,500. Amount expended on permanent improvements, $2,180. Amount expended on sanitation, $61. E. Sackrider, Township Clerk, New Liskeard.

Hullett, Tp.—Good openings for tinsmith and harnessmaker. Number of buildings erected, 4; cost $9,000. Amount expended on permanent improvements, $8,695. J. Campbell, Township Clerk, Londesboro.

Humberstone, V.—Telephone system started. Good openings for all kinds of industries. Number of buildings erected, 50; cost $102,500. Amount expended on permanent improvements, $2,807. Amount expended on sanitation, $11. J. J. Wichmann, Village Clerk, Humberstone.

Humberstone, Tp.—Good openings for various industries. Number of buildings erected, 18; cost $27,300. Amount expended on permanent improvements, $2,309. Amount expended on sanitation, $88. A. E. Near, Township Clerk, Gas Line.

Humphrey, Tp.—No new buildings erected. Amount expended on permanent improvements, $3,000. A. A. Young, Township Clerk, Rosseau.

Hungerford, Tp.—Rock quarry started. Good opening for creamery or milk condensor. Number of buildings erected, 50; cost $75,000. Amount expended on permanent improvements, $1,000. G. H. Stokes, Township Clerk, Tweed.

Huntingdon, Tp.—Stone crushing industry started. Opening for canning factory and creamery. Number of buildings erected, 4; cost $3,000. Amount expended on permanent improvements, $700. D. L. Fleming, Township Clerk, Ivanhoe.

Huntley, Tp.—Good opening for general store. Number of buildings erected, 3; cost $3,500. Amount expended on permanent improvements, $3,982. J. H. Wilson, Township Clerk, Carp.

Huntsville, Tn.—Owns and operates waterworks and electric light plant, cost $53,728. Openings for industries of any description. One new building erected, cost $8,000. Amount expended on permanent improvements, $700. T. M. Cullon, Town Clerk, Huntsville.

Huron, Tp.—Owns and operates telephone system, cost $40,000. Good openings for canning factory, cement, tile and brick factory, furniture factory, creamery, butter factory, milk condensor. Number of buildings erected, 11; cost $16,000. Amount expended on permanent improvements, $8,968. Amount expended on sanitation, $168. Angus Martyn, Township Clerk, Ripley.

IGNACE, Tp.—Number of buildings erected, 5; cost $6,000. Amount expended on permanent improvements, $794. W. Earles, Township Clerk, Ignace.

INGERSOLL, Tn.—Owns and operates waterworks, cost $125,000; hydro-electric and power plant, cost $100,000. Good openings for various industries. Number of buildings erected, 15; cost $80,000. W. R. Smith, Town Clerk, Ingersoll.

INNISFIL, Tp.—Number of buildings erected, 11; cost $12,000. Amount expended on permanent improvements, $5,400. Amount expended on sanitation, $580. R. M. McConkey, Township Clerk, Stroud.

IROQUOIS, V.—Owns and operates waterworks and electric light plant, cost $40,000. Good opening for any kind of industry. One new building erected, cost $4,000. Amount expended on permanent improvements, $800. Allen McInnis, Village Clerk, Iroquois.

JAFFRAY AND MELICK, Tps.—Number of buildings erected, 10; cost $3,500. Amount expended on permanent improvements, $1,500. C. W. Belyea, Township Clerk, Kenora.

JAMES, Tp.—Saw mill started. No new buildings erected. Amount expended on permanent improvements, $520. J. H. Forbes, Township Clerk, Elk Lake.

JARVIS, V.—Saw mill and cider and vinegar factory started. Good opening for planing mill and sash and door factory. Number of buildings erected, 4; cost $7,000. Amount expended on permanent improvements, $600. A Rodgers, Village Clerk, Jarvis.

JENNINGS, Tp.—See Casimer, Jennings and Appleby Tps.

JOCELYN, Tp.—Amount expended on permanent improvements, $900. H. Johnson, Township Clerk, Kentvale.

JOHNSON, Tp.—Owns and operates telephone system, cost $3,029. Good opening for cheese factory, box factory, woodworking factories. Number of buildings erected, 4; cost $1,300. Amount expended on permanent improvements, $600. A. E. Osborne, Township Clerk, Port Lock P.O.

JOLY, Tp.—Good openings for woodworking factories. Number of buildings erected, 2; cost $1,200. Amount expended on permanent improvements, $244. G. Harkness, Township Clerk, Sundridge.

JONES, Tp.—See Sherwood, Jones and Burns Tps.

KALADAR, ANGLESEA AND EFFINGHAM, Tps.—Good opening for cheese box factory, basket factory. No new buildings erected. Amount expended on permanent improvements, $834. M. Lessard, Township Clerk, Flinton.

KEARNEY, Tn.—Shingle mill started. Owns and operates waterworks, cost $700. Good openings for sash and door factory, planing mill, veneer, stave and heading factory, wood alcohol factory. No new buildings erected. Amount expended on permanent improvements, $250. Amount expended on sanitation, $135. J. J. Brosman, Town Clerk, Kearney.

KEEWATIN, Tn.—Good opening for flour mill, pulp mill, box and tub factory. Number of buildings erected, 4; cost $3,500. Amount expended on permanent improvements, $1,522. W. J. Craig, Town Clerk, Keewatin.

KEMPTVILLE, V.—Good openings for industries of any character. Number of buildings erected, 5; cost $20,000. Amount expended on permanent improvements, $1,300. S. H. Guest, Village Clerk, Kemptville.

KENNEBEC, Tp.—No new buildings erected. Amount expended on permanent improvements, $1,682. D. A. Osborne, Township Clerk, Arden.

KENORA, Tn.—Cigar factory started. Owns and operates waterworks, cost $212,872; hydro-electric power, cost $507,637; electric distribution system, cost $43,159; telephone system, cost $17,453. Good openings for industries of any character. Number of buildings erected, 10; cost $100,000. Amount expended on permanent improvements, $6,000. Amount expended on sanitation, $1,500. G. C. Hay, Town Clerk, Kenora.

KEPPEL, Tp.—Good opening for woodworking industry. Number of buildings erected, 10; cost $9,200. Amount expended on permanent improvements, $3,696. Amount expended on sanitation, $181. G. Atkey, Township Clerk, Wiarton.

KERNS, Tp.—Number of buildings erected, 2; cost $1,000. Amount expended on permanent improvements, $2,600. H. M. Ship, Township Clerk, Milberta.

KILLALOE STATION, V.—Good opening for flour mill. One new building erected cost $1,000. Amount expended on sanitation, $15. P. J. Harrington, Village Clerk, Killaloe Station.

KINCARDINE, Tn.—Owns and operates waterworks, cost $50,085; electric light plant, cost $22,336. Good openings for industries of any character. No new buildings erected. Amount expended on permanent improvements, $2,500. Amount expended on sanitation, $80. J. H. Scougall, Town Clerk, Kincardine.

KINCARDINE, Tp.—Number of buildings erected, 4; cost $5,000. Amount expended on permanent improvements, $7,750. Hugh A. Smith, Township Clerk, Armow.

KING, Tp.—Owns and operates telephone system, cost $9,500. Number of buildings erected, 28; cost $5,200. Amount expended on permanent improvements, $11,589. Amount expended on sanitation, $196. J. L. Jenkins, Township Clerk, King.

KINGSTON, C.—Floor and wall tile factory started. Owns and operates waterworks, value $318,870; gas plant, value $202,421; electric light plant, value $186,857. Good openings for industries of any character. Number of buildings erected, 190; cost $604,800. Amount expended on permanent improvements, $89,500. Amount expended on sanitation, $10,750. W. W. Sands, City Clerk, Kingston.

KINGSTON, Tp.—Number of buildings erected, 30; cost $11,000. Amount expended on permanent improvements, $8,669. Amount expended on sanitation, $150. C. F. Adair, Township Clerk, Cataraqui.

KINGSVILLE, Tn.—Owns and operates waterworks, cost $33,000. Good openings for various industries. Number of buildings erected, 17; cost. $20,400. Amount expended on permanent improvements, $4,500. Amount expended on sanitation, $86. G. Pearse, Town Clerk, Kingsville.

KINLOSS, Tp.—One new building erected, cost $1,000. Amount expended on permanent improvements, $3,609. T. Murray, Township Clerk, Langside.

KITLEY, Tp.—Number of buildings erected, 4; cost $4,000. Amount expended on permanent improvements, $5,931. J. M. Edgar, Township Clerk, Toledo.

KORAH AND PARKE, Tps.—Good openings for box factory, chair factory, etc. Number of buildings erected, 16; cost $21,900. Amount expended on permanent improvements, $6,500. R. M. Moore, Township Clerk, Korah.

LAIRD, Tp.—Owns and operates municipal telephone, cost $6,000. Good opening for brick and tile factory. Number of buildings erected, 10; cost $9,800. Amount expended on permanent improvements, $1,157. F. H. Schoales, Township Clerk, Laird.

Lake, Tp.—See Marmora and Lake Tps.

Lakefield, V.—Opening for woodworking industry. No new buildings erected. Amount expended on permanent improvements, $1,500. Amount expended on sanitation, $100. W. Sherin, Village Clerk, Lakefield.

Lanark, V.—Woollen mills started. Number of buildings erected, 2; cost $6,800. Amount expended on permanent improvements, $1,689. R. Beatty, Village Clerk, Lanark.

Lanark, Tp.—Number of buildings erected, 3; cost $1,050. Amount expended on permanent improvements, $909. Amount expended on sanitation, $53. A. Rankin, Township Clerk, Middleville.

Lancaster, V.—Openings for various industries. Number of buildings erected, 8; cost $14,400. Amount expended on permanent improvements, $900. W. J. McNaughton, Village Clerk, Lancaster.

Lancaster, Tp.—Good opening for milk condensor. Number of buildings erected, 7; cost $30,000. Amount expended on permanent improvements, $1,049. A. J. McDonald, Township Clerk, North Lancaster.

Lansdowne Front, Tp.—See Leeds and Lansdowne Front Tps.

Lansdowne Rear, Tp.—See Leeds and Lansdowne Rear Tps.

Latchford, Tn.—Saw mill started. Good opening for pulp mill, saw mill, or any industries requiring power. No new buildings erected. Amount expended on permanent improvements, $33. S. A. Starling, Town Clerk, Latchford.

Lavellee, Tp.—Flour mill started. Good opening for creamery and cheese factory. Number of buildings erected, 6; cost $3,100. Amount expended on permanent improvements, $3,144. Amount expended on sanitation, $50. A. Cooke, Township Clerk, Devlin.

Lavant, Tp.—Number of buildings erected, 2; cost $1,000. Amount expended on permanent improvements, $94. W. Browning, Township Clerk, Lavant Station.

Laxton, Digby and Longford, Tps.—Two saw mills started. Good openings for butter and cheese factory, grist and chopping mill. Number of buildings erected, 6; cost $4,500. Amount expended on permanent improvements, $1,500. E. F. LeCraw, Township Clerk, Norland.

Leamington, Tn.—Owns and operates waterworks, cost $27,500; gas plant, cost $25,000. Good opening for any kind of industry. Number of buildings erected, 70; cost $105,000. Amount expended on permanent improvements, $18,896. Amount expended on sanitation, $3,607. R. M. Selkirk, Town Clerk, Leamington.

Leaside, Tn.—Wire and cable industry started. Waterworks and sewer system started, cost $80,000. Openings for industries of any character. Amount expended on permanent improvements, $40,000. A. T. Lawson, Town Clerk, Leaside Junction.

Leeds and Lansdowne Front, Tps.—Good opening for machine and repair shop. Number of buildings erected, 5; cost $6,500. Amount expended on permanent improvements, $12,786. Amount expended on sanitation, $112. J. D. Darling, Township Clerk, Lansdowne.

Leeds and Lansdowne Rear, Tps.—Number of buildings erected, 8; cost $8,000. Amount expended on permanent improvements, $3,600. R. J. Green, Township Clerk, Soperton.

Limerick, Tp.—Good opening for mining industries and saw mills. No new buildings erected. Amount expended on permanent improvements, $1,364. B. W. Weller, Township Clerk, Steenburg P.O.

LINDSAY, Tn.—Owns and operates waterworks, cost $128,631. Good opening for woodworking industries, tannery, foundry and machine shop, farming machinery. Number of buildings erected, 35; cost $50,000. Amount expended on permanent improvements, $107,500. Amount expended on sanitation, $28,000. D. Ray, Town Clerk, Lindsay.

LINDSAY, Tp.—Good opening for chemical works. Number of buildings erected, 2; cost $1,500. Amount expended on permanent improvements, $2,007. P. A. Currie, Township Clerk, Cape Chin.

LISTOWEL, Tn.—Milk factory and knitting factory started. Owns and operates waterworks, value $46,000; electric light plant, value $20,170. Good openings for condensed milk factory. Number of buildings erected, 2; cost $5,000. Amount expended on permanent improvements, $5,500. W. Bright, Town Clerk, Listowel.

LITTLE CURRENT, Tn.—Openings for various industries. Number of buildings erected, 12; cost $13,000. Amount expended on permanent improvements, $1,200. D. McGilvery, Town Clerk, Little Current.

LOBO, Tp.—Number of buildings erected, 10; cost $15,000. Amount expended on permanent improvements, $9,725. Amount expended on sanitation, $75. E. R. Barclay, Township Clerk, Poplar Hill.

LOCHIEL, Tp.—Number of buildings erected, 10; cost $12,000. Amount expended on permanent improvements, $8,000. Amount expended on sanitation, $150. V. G. Chisholm, Township Clerk, Lochiel.

LOGAN, Tp.—No new buildings erected. Amount expended on permanent improvements, $12,321. M. Leake, Township Clerk, Mitchell.

LONDON, C.—Biscuit and candy factory, litho factory, cereal factory, cold storage started. Owns and operates waterworks, cost $1,135,528; lighting system, cost $470,073. Good openings for industries of any character. Number of buildings erected, 100; cost $1,789,920. Amount expended on permanent improvements, $62,079. Amount expended on sanitation, $622,829. S. Baker, City Clerk, London.

LONDON, Tp.—Good opening for industries of all kinds. Number of buildings erected, 100; cost $100,000. Amount expended on permanent improvements, $23,427. Amount expended on sanitation, $166. Mary Grant, Township Clerk, 110 Dundas St., London.

LONGFORD, Tp.—See Laxton, Digby and Longford Tps.

LONGUEUIL, Tp.—No new buildings erected. Amount expended on permanent improvements, $112. Ed. Carriere, Township Clerk, Ritchance.

LORNE, Tp.—See Nairn and Lorne Tps.

LOUGHBOROUGH, Tp.—Good opening for brickyard. No new buildings erected. Amount expended on permanent improvements, $3,405. F. M. Lawson, Township Clerk, Sydenham.

LOUTH, Tp.—Canning factory and basket factory started. Good opening for creamery. Number of buildings erected, 32; cost $52,875. Amount expended on permanent improvements, $4,139. M. A. Ball, Township Clerk, Jordan.

LUCAN, V.—Owns and operates electric light plant, cost $5,000. Good openings for various industries. No new buildings erected. G. A. Stanley, Village Clerk, Lucan.

LUCKNOW, V.—Bag-holder factory started. Owns and operates waterworks for fire protection only, cost $10,000. Number of buildings erected, 3, cost $4,000. J. Agnew, Village Clerk, Lucknow.

Luther E., Tp.—Opening for grist mill and cheese factory. Number of buildings erected, 3; cost $5,400. Amount expended on permanent improvements, $11,698. Amount expended on sanitation, $92. J. A. Richardson, Township Clerk, Grand Valley.

Luther W., Tp.—Amount expended on permanent improvements, $2,036. Amount expended on sanitation, $74. W. W. Duncan, Township Clerk, Conn.

Lutterworth, Tp.—Number of buildings erected, 5; cost $2,000. Amount expended on permanent improvements, $450. J. H. Hulbig, Township Clerk, Minden.

Lynedoch, Tp.—See Brudenell and Lyndoch Tps.

McClure, Tp.—See Bangor and McClure Tps.

McDougall, Tp.—Good openings for woodworking industries. One new building erected, cost $30,000. Amount expended on permanent improvements, $1,205. J. E. Armstrong, Township Clerk, Parry Sound.

McGillivray, Tp.—Number of buildings erected, 20; cost $24,500. Amount expended on permanent improvements, $10,000. J. D. Drummond, Ailsa Craig.

McIrvine, Tp.—Owns and operates electric light plant, cost $1,000. Good opening for flour mill, lumber mill, implement factory, woodworking industries. Number of buildings erected, 26; cost $16,615. Amount expended on permanent improvements. $3,000. Frank J. Strain, Township Clerk, Fort Frances.

McKellar, Tp.—Good opening for woollen mill. Number of buildings erected, 6; cost, $4,000. Amount expended on permanent improvements, $269. Amount expended on sanitation, $94. J. Fletcher, Township Clerk, McKellar.

McKillop, Tp.—Owns and operates telephone system, cost $18,000. Number of buildings erected, 5; cost $6,500. Amount expended on permanent improvements, $6,305. Amount expended on sanitation, $298. M. Murdie, Township Clerk, Seaforth.

McKim, Tp.—Number of buildings erected, 13; cost, $2,600. Amount expended on permanent improvements, $3,229. Amount expended on sanitation, $139. J. R. Vincent, Township Clerk, Sudbury.

McLean and Ridout, Tps.—Good openings for woodworking industries. Number of buildings erected, 3; cost $2,000. Amount expended on permanent improvements, $100. Amount expended on sanitation, $75. W. H. Brown, Township Clerk, Baysville.

McMurrich, Tp.—Basket factory and sawmill started. Good opening for sash and door factory. One new building erected, cost $800. Amount expended on permanent improvements, $626. D. C. McFarlane, Township Clerk, Sprucedale.

McNab, Tp.—Number of buildings erected, 4; cost $8,500. Amount expended on permanent improvements, $4,000. J. McGregor, Township Clerk, Renfrew.

Macaulay, Tp.—Number of buildings erected, 3; cost $2,000. Amount expended on permanent improvements, $100. A. Barron, Township Clerk, Bracebridge.

Macdonald, Meredith and Aberdeen, Tps.—Owns and operates telephone system, cost $2,400. Good opening for sawmills, planing mills. Number of buildings erected, 9; cost $6,000. Amount expended on permanent improvements, $2,250. Amount expended on sanitation, $52. W. L. Cherry, Township Clerk, Sylvan Valley.

MACHAR, Tp.—Good openings for saw mill and woodworking industries. Number of buildings erected, 4; cost $3,300. Amount expended on permanent improvements, 396, Amount expended on sanitation, $30. A. McKee, Township Clerk, Stewart's Bay.

MACHIN, Tp.—Good openings for saw mill, grist mill, lumber, sash and door factory, pulp mill, etc. Number of buildings erected, 3; cost $1,800. Amount expended on permanent improvements, $2,500. W. W. Howell, Township Clerk, Minnitaki.

MADOC, V.—Sash and door factory started. Owns and operates electric light plant, cost $5,000. Good openings for broom factory, canning factory, condensed milk, granite, limestone and trap quarries. Number of buildings erected, 3; cost $33,000. Amount expended on permanent improvements, $500. R. R. Casement, Village Clerk, Madoc.

MADOC, Tp.—Number of buildings erected, 7; cost $7,000. Amount expended on permanent improvements, $5,500. W. T. Allen, Township Clerk, Madoc.

MAIDSTONE, Tp.—Owns and operates telephone system, cost $13,995. Opening for brick and tile yard, canning factory. Number of buildings erected, 60; cost $60,000. Amount expended on permanent improvements, $4,393. Amount expended on sanitation, $258. W. R. Phillips, Township Clerk, Maidstone.

MALAHIDE, Tp.—Good opening for flour mill. No new buildings erected. Amount expended on permanent improvements, $9,000. Amount expended on sanitation, $50. J. M. Hale, Township Clerk, Aylmer.

MALDEN, Tp.—Amount expended on permanent improvements, $2,640. E. H. Pratt, Township Clerk, Malden Centre.

MANVERS, Tp.—Number of buildings erected, 4; cost $2,900. Amount expended on permanent improvements, $2,470. Amount expended on sanitation, $411. J. J. Preston, Township Clerk, Bethany.

MARA, Tp.—Good openings for small industries; planing and other woodworking factories. Number of buildings erected, 6; cost $10,000. Amount expended on permanent improvements, $11,000. W. R. McPhee, Township Clerk, Brechin.

MARIA, Tp.—See Head, Maria and Clara Tps.

MARCH, Tp.—Amount expended on permanent improvements, $1,940. Amount expended on sanitation, $119. T. Richardson, Township Clerk, South March.

MARIPOSA, Tp.—Good opening for medical doctor at Oakwood. Number of buildings erected, 6; cost $25,100. Amount expended on permanent improvements, $7,000. Amount expended on sanitation, $100. J. B. Weldon, Township Clerk, Oakwood.

MARKHAM, V.—Owns and operates waterworks and electric light plant, cost $15,000. Good opening for foundry and machine shop. No new buildings erected. Amount expended on permanent improvements, $1,000. M. White, Village Clerk, Markham.

MARKHAM, Tp.—Number of buildings erected, 15; cost $25,000. Amount expended on permanent improvements, $13,463. C. H. Stiver, Township Clerk, Unionville.

MARLBOROUGH, Tp.—No new buildings erected. Amount expended on permanent improvements, $796. Edward Mills, Township Clerk, North Gower.

MARMORA, V.—Owns and operates electric light plant, cost $6,000. Good opening for woodworking industry. One new building erected, cost $1,200.

Amount expended on permanent improvements, $250. H. W. Sabine, Village Clerk, Marmora.

MARMORA AND LAKE, Tps.—Good opening for mining. No new buildings erected. Amount expended on permanent improvements, $1,733. Chas. Jones, Township Clerk, Marmora.

MARTLAND, Tp.—Cheese factory started. Number of buildings erected, 11; cost $2,200. Amount expended on permanent improvements, $1,000. J. Guerin, Township Clerk, Noelville.

MARYBOROUGH, Tp.—Good opening for furniture factory, etc. Number of buildings erected, 8; cost $18,000. Amount expended on permanent improvements, $14,138. Amount expended on sanitation, $462. W. W. Scott, Township Clerk, Moorefield.

MARYSBURGH, N., Tp.—Canning factory started. Good opening for canning industry. Number of buildings erected, 2; cost $2,500. Amount expended on permanent improvements, $1,000. Amount expended on sanitation, $500. L. Williams, Township Clerk, Picton.

MARYSBURGH, S., Tp.—Number of buildings erected, 3; cost $3,000. Amount expended on permanent improvements, $500. H. F. Grimmon, Township Clerk, Milford.

MASSEY, Tn.—Owns and operates waterworks, cost $23,882. Good openings for various industries. Number of buildings erected, 2; cost $3,000. Amount expended on permanent improvements, $254. D. W. Cantlon, Town Clerk, Massey Station.

MATAWATCHAN, Tp.—See Griffith and Matawatchan Tps.

MATCHEDASH, Tp.—Good opening for blacksmith and general repair shop. No new buildings erected. Amount expended on permanent improvements, $1,000. E. W. Kitchen, Township Clerk, Lovering.

MATHESON, Tn.—Good openings for brick yard, cement blocks, sash and door factory, lath and shingle mill, baker, harness shop, hardware, etc. Number of buildings erected, 10; cost $5,500. Amount expended on permanent improvements, $80. E. B. Sanders, Town Clerk, Matheson.

MATILDA, Tp.—Number of buildings erected, 5; cost $10,000. Amount expended on permanent improvements, $8,634. J. J. Payne, Township Clerk, Brinston.

MATTAWA, Tn.—Good opening for saw mill, planing mill, etc. Number of buildings erected, 2; cost $30,000. Amount expended on permanent improvements, $1,000. J. McMeekin, Town Clerk, Mattawa.

MATTAWAN, Tp.—Good opening for pulp mill and saw mill. Number of buildings erected, 3; cost $1,500. Amount expended on permanent improvements, $600. H. F. McMinn, Township Clerk, Mattawa.

MAXVILLE, V.—Good opening for various industries. One new building erected, cost $10,000. Amount expended on permanent improvements, $300. Amount expended on sanitation, $100. D. P. McDiarmid, Village Clerk, Maxville.

MAY, Tp.—See Salter, May and Harrow Tps.

MAYO, Tp.—Number of buildings erected, 2; cost $1,000. Amount expended on permanent improvements, $600. Amount expended on sanitation, $55. J. Douglas, Township Clerk, Fort Stewart.

MEAFORD, Tn.—Wood splitter works started. Owns and operates waterworks, cost $40,000. Openings for industries of any character. Number of buildings

erected, $30; cost $35,000. Amount expended on permanent improvements, $25,000. G. G. Albery, Town Clerk, Meaford.

MEDONTE, Tp.—Owns and operates telephone system, value $20,000. Openings for brick and tile works, shingle and saw mills. Number of buildings erected, 15; cost, $15,000. Amount expended on permanent improvements, $5,000. T. D. Robinson, Township Clerk, Moonstone.

MEDORA AND WOOD, Tps.—Number of buildings erected, 9; cost $10,000. Amount expended on permanent improvements, $5,086. Amount expended on sanitation, $358. H. C. Guy, Township Clerk, Dudley.

MELANCTHON, Tp.—Number of buildings erected, 15; cost $20,000. Amount expended on permanent improvements, $12,000. Amount expended on sanitation, $30. T. K. Slack, Township Clerk, Melancthon.

MELICK, Tp.—See Jaffray and Melick Tps.

MEREDITH, Tp.—See Macdonald, Meredith and Aberdeen Tps.

MERRICKVILLE, V.—Openings for industries of any character. Number of buildings erected, 2; cost $1,400. Amount expended on permanent improvements, $1,200. Amount expended on sanitation, $1,075. D. J. Hall, Village Clerk, Merrickville.

MERRITTON, V.—Owns and operates waterworks, cost $86,000; electric light plant, $10,000. Good openings for various industries. Number of buildings erected, 12; cost $18,000. Amount expended on permanent improvements, $16,071. Amount expended on sanitation, $400. R. Clark, Village Clerk, Merritton.

MERSEA, Tp.—Good opening for a canning factory. Number of buildings erected, 25; cost $16,000; Amount expended on permanent improvements, $6,700. Amount expended on sanitation, $74. A Hairsine, Township Clerk, Leamington.

METCALFE, Tp., Number of buildings erected, 5; cost $5,000. Amount expended on permanent improvements, $4,000. H. Thompson, Township Clerk, Kerrwood.

METHUEN, Tp.—See Belmont and Methuen Tps.

MIDDLETON, Tp.—Amount expended on permanent improvements, $7,183. D. W. White, Township Clerk, Courtland.

MIDLAND, Tn.—Malleable iron works started. Owns and operates waterworks, cost $104,500; electric light plant, cost $60,000. Good openings for wood and iron industries. Number of buildings erected, 30; cost $60,000. Amount expended on permanent improvements, $8,000. Amount expended on sanitation, $650. F. R. Weston, Town Clerk, Midland.

MILLBROOK, V.—Planing mill started. Good openings for furniture factory, canning factory, evaporator. Number of buildings erected, 2; cost $20.000. Amount expended on permanent improvements, $800. W. S. Given, Village Clerk, Millbrook.

MILTON W., Tn.—Owns and operates waterworks, cost $34,000; electric light plant, cost $24,319. Good opening for industries of any character. Number of buildings erected, 20; cost $40,000. Amount expended on permanent improvements, $16,000. Amount expended on sanitation, $100. G. A. Hemstreet, Town Clerk, Milton West.

MILLER, Tp.—See Clarendon and Miller Tps.

MILVERTON, V.—Furniture factory started. Openings for woollen mill, cheese factory, carriage factory. Number of buildings erected, 8; cost $12,000. Amount expended on permanent improvements, $3,000. W. D. Weir, Village Clerk, Milverton.

Mimico, V.—Owns and operates hydro-electric system, cost $20,000. Openings for various industries. Number of buildings erected, 30; cost $60,000. Amount expended on permanent improvements, $9,880. Amount expended on sanitation, $229. J. A. Keefer, Village Clerk, Mimico.

Minden, Tp.—Number of buildings erected, 3; cost $2,000. Amount expended on permanent improvements, $800. E. A. Rogers, Township Clerk, Minden.

Minto, Tp.—Good opening for milk condenser. Number of buildings erected, 3; cost $5,000. Amount expended on permanent improvements, $5,362. W. D. McLellan, Township Clerk, Harriston.

Mitchell, Tn.—Owns and operates waterworks and electric light plant, value $50,000. Good openings for various industries. Number of buildings erected, 8; cost $40,000. W. Ryan, Town Clerk, Mitchell.

Monaghan N., Tp.—Good openings for industries of any character. Number of buildings erected, 30; cost $50,000. Amount expended on permanent improvements, $6,187. B. Johnston, Township Clerk, Peterborough.

Monaghan, S., Tp.—One new building erected, cost $1,500. Amount expended on permanent improvements, $1,162. O. B. Johnson, Township Clerk, South Monaghan.

Monck, Tp.—Saw-mill started. Openings for mills and factories. Number of buildings erected, 22; cost $30,000. Amount expended on permanent improvements, $2,865. Amount expended on sanitation, $85. H. F. Bickmore, Township Clerk, Alport.

Monmouth, Tp.—Good opening for mining. No new buildings erected. J. Moore, Township Clerk, Wilberforce.

Mono, Tp.—Number of buildings erected, 2; cost $2,000. Amount expended on permanent improvements, $4,279. Amount expended on sanitation, $51. W. A. Henry, Township Clerk. Mono Centre.

Montague, Tp.—Number of buildings erected, 8; cost $7,000. Amount expended on permanent improvements, $2,500. J. E. Edmunds, Township Clerk, Smith's Falls.

Monteagle and Herschel, Tps.—Good opening for pulp mill and furniture factory. No new building erected. Amount expended on permanent improvements, $2,500. Amount expended on sanitation, $150. G. A. Jordison, Township Clerk, Maynooth.

Moore, Tp.—Owns and operates telephone system, value $38,000. Openings for lumber yards, planing mill, brick yard. Number of buildings erected, 6; cost $5,000. Amount expended on permanent improvements, $10,000. C. C. Watson, Township Clerk, Brigden.

Morley, Tp.—Butter factory started. Openings for planing mill, woodworking factory, grist mill. Number of buildings erected, 10; cost $8,000. Amount expended on permanent improvements, $4,300. G. G. Gamsby, Township Clerk, Stratton.

Mornington, Tp.—Number of buildings erected, 8; cost $11,500. Amount expended on permanent improvements, $15,492. W. Waddell, Township Clerk, Burns.

Morris, Tp.—Owns and operates telephone system, cost $31,558. No new buildings erected. Amount expended on permanent improvements, $23,131. Amount expended on sanitation, $20. A. MacEwen, Township Clerk, Bluevale.

Morrisburg, V.—Owns and operates waterworks, cost $30,000; electric light plant, cost $35,000. Good openings for industries of any character. No new buildings erected. F. R. Chalmers, Village Clerk, Morrisburg.

Morrison, Tp.—Number of buildings erected, 13; cost $2,000. Amount expended on permanent improvements, $570. J. T. Bayley, Township Clerk, Severn Bridge.

Mosa, Tp.—Good openings for brick and tile works, concrete factory, cheese factory. Number of buildings erected, 7; cost $10,000. Amount expended on permanent improvements, $6,023. C. C. McNaughton, Township Clerk, Newbury.

Moulton, Tp.—Openings for cement industries. Number of buildings erected, 13; cost $7,100. Amount expended on permanent improvements, $563. Geo. A. Duff, Township Clerk, Lowbanks.

Mount Forest, Tn.—Owns and operates waterworks and electric light plant, cost $50,000. Good opening for lumber yard and planing mill. Number of buildings erected, 2; cost $5,000. Amount expended on permanent improvements, $1,500. W. C. Perry, Town Clerk, Mount Forest.

Mountain, Tp.—Number of buildings erected, 5; cost $12,000. Amount expended on permanent improvements, $4,128. J. E. Crowder, Township Clerk, Inkerman.

Mulmur, Tp.—Electric light and power plant started. No new buildings erected. Amount expended on permanent improvements, $3.220. Geo. Laking, Township Clerk, Shelburne.

Murray, Tp.—Number of buildings erected, 4; cost $6,000. Amount expended on permanent improvements, $4,585. W. Little, Township Clerk, Wooler.

Muskoka, Tp.—No new buildings erected. Amount expended on permanent improvements, $1,571. Amount expended on sanitation, $44. J. Brydon, Township Clerk, Gravenhurst.

Nairn and Lorne, Tps.—No new buildings erected. Amount expended on permanent improvements, $103. H. Edwards, Township Clerk, Nairn Centre.

Napanee, Tn.—Good opening for industries of any character. Number of buildings erected, 2; cost $3,000. Amount expended on permanent improvements, $1,500. Amount expended on sanitation, $2,000. W. A. Grange, Town Clerk, Napanee.

Nassagaweya, Tp.—Pressed brick works started. Number of buildings erected, 4; cost $2,500. Amount expended on permanent improvements, $2,800. Amount expended on sanitation, $50. John Marshall, Township Clerk, Campbellville.

Neebing, Tp.—Good opening for brick yard, saw mill, etc. One new building erected, cost $500. Amount expended on permanent improvements, $10,000. W. M. Rae, Township Clerk, Fort William.

Neelon and Garson, Tps.—Number of buildings erected, 27; cost $25,000. Amount expended on permanent improvements, $2,217. Amount expended on sanitation, $160. J. R. Vincent, Township Clerk, Box 322, Sudbury.

Nelson, Tp.—Number of buildings erected, 10; cost $13,000. Amount expended on permanent improvements, $6,700. J. F. Richardson, Township Clerk, Milton.

Nepean, Tp.—Good opening for brick and tile yard. Number of buildings erected, 250; cost $200,000. Amount expended on permanent improvements, $10,662. Amount expended on sanitation, $1,852. J. Gamble, Township Clerk, Westboro.

Nepigon, Tp.—Owns and operates waterworks, cost $3,000. Good opening for pulp mills. Number of buildings erected, 2; cost $2,275. Amount expended on permanent improvements, $91. P. F. Bull, Township Clerk, Nepigon.

Neustadt, V.—Furniture factory started. Number of buildings erected, 3; cost $10,000. Amount expended on permanent improvements, $623. R. W. Walden, Village Clerk, Neustadt.

New Hamburg, V.—Owns and operates electric light plant, cost $25,000. Opening for furniture factory, electric motors, etc. Number of buildings erected, 22; cost $43,000. Amount expended on permanent improvements, $6,000. J. F. Katzenmeier, Village Clerk, New Hamburg.

New Liskeard, Tn.—Cold storage plant, seed warehouse started. Owns and operates waterworks, value $90,764. Openings for pulp mill, shingle mill, excelsior factory, ice cream factory, woodworking factory. Number of buildings, erected, 12; cost $15,400. Amount expended on permanent improvements, $3,932. Amount expended on sanitation, $3,310. J. I. Dixon, Town Clerk, New Liskeard.

Newboro, V.—Good opening for canning factory. Number of buildings erected, 3; cost $3,800. Amount expended on permanent improvements, $50. W. S. Bilton, Village Clerk, Newboro.

Newburgh, V.—Opening for dentist, canning factory. No new buildings erected. Amount expended on permanent improvements, $708. C. Welbanks, Village Clerk, Newburgh.

Newbury, V.—Owns and operates electric light plant, cost $2,500. Good opening for harnessmaker. Number of buildings erected, 2; cost $2,200. Amount expended on permanent improvements, $160. C. Tucker, Village Clerk, Newbury.

Newcastle, V.—Good opening for canning factory, cooperage. Number of buildings erected, 2; cost $20,000. Amount expended on permanent improvements, $1,000. Amount expended on sanitation, $100. G. Jamieson, Village Clerk, Newcastle.

Newmarket, Tn.—Owns and operates waterworks and electric light plant, cost $42,000. Good opening for boot and shoe factory, sash and door factory, etc. Number of buildings erected, 30; cost $60,000. Amount expended on permanent improvements, $5,000. Amount expended on sanitation, $1,000. P. Anderson, Town Clerk, Newmarket.

New Toronto, V.—Owns and operates hydro-electric plant, cost about $7,000. Number of buildings erected, 20; cost $25,000. Amount expended on permanent improvements, $3,590. Amount expended on sanitation, $600. G. D. Scott, Village Clerk, New Toronto.

Niagara, Tn.—Owns and operates waterworks, cost $36,000; electric light plant, cost $25,000. Good opening for basket factory. Number of buildings erected, 12; cost $64,600. Amount expended on permanent improvements, $4,259. Amount expended on sanitation, $99. W. E. Lyall, Town Clerk, Niagara.

Niagara, Tp.—Openings for canning factories. Number of buildings erected, 6; cost $10,000. Amount expended on permanent improvements, $4,000. J. Knox, Township Clerk, Niagara.

Niagara Falls, C.—Owns and operates waterworks, value $247,300; electric light plant, value $152,400. Openings for industries using electric power. Number of buildings erected, 164; cost $398,350. Amount expended on permanent improvements, $30,000. Amount expended on sanitation, $8,000. W. J. Seymour, City Clerk, Niagara Falls.

Nichol, Tp.—Tannery started. Number of buildings erected, 5; cost $13,500. Amount expended on permanent improvements, $2,336. J. R. Wissler, Township Clerk, Salem.

Nightingale, Tp.—See Sherbourne, etc., Tps.

Nipissing, Tp.—Number of buildings erected, 7; cost $5,500. Amount expended on permanent improvements, $193. W. S. Rowson, Township Clerk, Nipissing.

Nissouri, E., Tp.—Owns and operates hydro-electric light, cost $2,200. Number of buildings erected, 8; cost $10,240. Amount expended on permanent improvements, $2,017. Amount expended on sanitation, $218. J. W. Sutherland, Township Clerk, Lakeside.

Nissouri W., Tp.—Number of buildings erected, 18; cost $12,000. Amount expended on permanent improvements, $5,156. J. H. Davis, Township Clerk, Belton.

Normanby, Tp.—Opening for industries of any character. No new buildings erected. Amount expended on permanent improvements, $15,000. R. H. Fortune, Township Clerk, Ayton.

North Bay, Tn.—Owns and operates waterworks, value $195,422; electric light plant, value $140,000. Good opening for woodworking industries. Number of buildings erected, 203; cost $492,910. Amount expended on permanent improvements, $40,293. Amount expended on sanitation, $26,398. A. G. Davis, Town Clerk, North Bay.

Norwich, V.—Owns and operates electric light plant, cost $14,300. Good opening for dairy supply factory. Number of buildings erected, 6; cost $15,000. Amount expended on permanent improvements, $800. Amount expended on sanitation, $284. W. Fairley, Village Clerk, Norwich.

Norwich N., Tp.—Condensing plant started. Good opening for tinsmithing and plumbing. Number of buildings erected, 27; cost $27,000. Amount expended on permanent improvements, $5,600. Amount expended on sanitation, $180. C. E. Burgess, Township Clerk, Burgessville.

Norwich, S., Tp.—Good openings for industries of any character. Number of buildings erected, 2; cost $2,000. Amount expended on permanent improvements, $4,675. A. McFarlane, Township Clerk, Otterville.

Norwood, V.—Good openings for cheese-box factory, sash and door factory, woollen mill, broom and brush factory. One new building erected, cost $800. E. J. Laing, Village Clerk, Norwood.

Nottawasaga, Tp.—Number of buildings erected, 3; cost $2,000. Amount expended on permanent improvements, $7,380. Amount expended on sanitation, $169. L. McAlister, Township Clerk, Duntroon.

Oakland, Tp.—No new buildings erected. Amount expended on permanent improvements, $700. P. M. Button, Township Clerk, Scotland.

Oakley, Tp.—One new building erected, cost $400. W. Bone, Township Clerk, Vankoughnet.

Oakville, Tn.—Paint works started. Owns and operates waterworks, cost $72,000; electric light plant, cost $18,000. Good opening for paper mills, foundries, etc. Number of buildings erected, 96; cost $59,324. Amount expended on permanent improvements, $26,800. Amount expended on sanitation, $81,190. W. E. M. Crawley, Town Clerk, Oakville.

O'Connor, Tp.—Good opening for stone crushing plant. Number of buildings erected, 6; cost $1,000. Amount expended on permanent improvements,

$1,826. Amount expended on sanitation, $200. C. J. Evans, Township Clerk, O'Conner.

Oil Springs, V.—Openings for industries of any character. No new buildings erected. Amount expended on permanent improvements, $754. Amount expended on sanitation, $45. D. P. Sisk, Village Clerk, Oil Springs.

Ojibway, Tn.—John Moynahan, Town Clerk, 21 Parent Avenue, Windsor.

Olden, Tp.—Number of buildings erected, 8; cost $3,000. Amount expended on permanent improvements, $2,000. Amount expended on sanitation, $35. W. P. Bender, Township Clerk, Long Lake.

Oliver, Tp.—Owns and operates telephone system, cost $8,000. Number of buildings erected, 12; cost $13,500. Amount expended on permanent improvements, $1,837. Amount expended on sanitation, $243. C. R. B. Hill, Township Clerk, Murillo.

Omemee, V.—No new buildings erected. Amount expended on permanent improvements, $420. W. H. Kennedy, Village Clerk, Omemee.

Oneida, Tp.—Good opening for brick and tile yard. Number of buildings erected, 6; cost $16,500. Amount expended on permanent improvements, $1,693. Amount expended on sanitation, $24. J. Senn, Township Clerk, Caledonia.

Onondaga, Tp.—Good opening for a tile yard. Number of buildings erected, 6; cost $4,600. Amount expended on permanent improvements, $6,200. Amount expended on sanitation, $11. A. Burrill, Township Clerk, Onondaga.

Ops, Tp.—Good openings for industries of various character. Number of buildings erected, 6; cost $6,500. Amount expended on permanent improvements, $6,573. Amount expended on sanitation, $146. W. E. Agnew, Township Clerk, Lindsay.

Orangeville, Tn.—Owns and operates waterworks, cost $54,000. Openings for factories of any description. Number of buildings erected, 5; cost $26,700. Amount expended on permanent improvements, $1,000. Amount expended on sanitation, $610. A. A. Hughson, Town Clerk, Orangeville.

Orford, Tp.—Number of buildings erected, 10; cost $12,500. Amount expended on permanent improvements, $5,071. Amount expended on sanitation, $63. F. Littlejohns, Township Clerk, Highgate.

Orillia, Tn.—Owns and operates waterworks, cost $120,000; electric light plant, cost $406,000. Amount expended on permanent improvements, $6,236. Amount expended on sanitation, $11,878. C. E. Grant, Town Clerk, Orillia.

Orillia, Tp.—Good opening for canning factory. Number of buildings erected, 7; cost $7,000. Amount expended on permanent improvements, $5,392. Amount expended on sanitation, $132. John C. Rose, Township Clerk, Orillia.

Oro, Tp.—Number of buildings erected, 8; cost $12,000. Amount expended on permanent improvements, $2,193. H. J. Tudhope, Township Clerk, Hawkestone.

Oshawa, Tn.—Builders' factory started. Owns and operates waterworks, cost $156,000. Good openings for agricultural implements, iron working industries, boots and shoes, water, gas and electric meters. Number of buildings erected, 100; cost $62,000. Amount expended on permanent improvements, $28,659. Amount expended on sanitation, $3,192. T. Morris, Town Clerk, Oshawa.

Osgoode, Tp.—Good opening for canning factory, preserving factory. Amount expended on permanent improvements, $10,663. F. Iveson, Township Clerk, Metcalfe.

Osnabruck, Tp.—Good opening for canning factory, peat works. Number of buildings erected, 36; cost $11,000. Amount expended on permanent improvements, $6,070. Amount expended on sanitation, $125. H. E. Hodgins, Township Clerk, Farran's Point.

Oso, Tp.—Good openings for cheese box factory, boot and shoe factory. Number of buildings erected, 6; cost $6,000. Amount expended on permanent improvements, $2,000. B. Smith, Township Clerk, Sharbot Lake.

Osprey, Tp.—Several sawmills started. Owns and operates telephone system, cost $8,370. Good openings for woodworking industries, brick and cement works. Number of buildings erected, 40; cost $24,500. Amount expended on permanent improvements, $3,132. Amount expended on sanitation, $185. T. Scott, Township Clerk, McIntyre.

Otonabee, Tp.—Number of buildings erected, 5; cost $6,000. Amount expended on permanent improvements, $7,501. J. H. Drummond, Township Clerk, Peterboro.

Ottawa, C.—Steel and iron works, aluminum casting works, wire cloth factory, machine shop, foundry started. Owns and operates waterworks, value $3,362,300; electric light and power plant, value $703,358. Good opening for any industry requiring water or electric power. Number of building erected, 545; cost $3,991,380. Amount expended on permanent improvements, $467,795. Amount expended on sanitation, $247,206. J. Henderson, City Clerk, Ottawa.

Owen Sound, Tn.—Malleable iron works started. Owns and operates waterworks, value $359,326; electric light and power, value $206,763; gas plant, value $156,142. Good openings for any kind of industries. Number of buildings erected, 97; cost $103,000. Amount expended on permanent improvements, $8,661. Amount expended on sanitation, $8,362. C. Gordon, Town Clerk, Owen Sound.

Oxford on Rideau, Tp.—Number of buildings erected, 2; cost $4,500. Amount expended on permanent improvements, $1,210. C. H. Anderson, Township Clerk, Oxford Mills.

Oxford E., Tp.—Good opening for evaporator. Number of buildings erected, 4; cost $9,200. Amount expended on permanent improvements, $6,367. Amount expended on sanitation, $183. F. G. Jackson, Township Clerk, Oxford Centre.

Oxford N., Tp.—Owns and operates electric light plant, cost $1,947. Number of buildings erected, 6; cost $10,000. Amount expended on permanent improvements, $2,500. Amount expended on sanitation, $100. R. Seldon, Township Clerk, Ingersoll.

Oxford W., Tp.—Owns and operates hydro-electric plant, cost $5,000. Number of buildings erected, 7; cost $25,300. Amount expended on permanent improvements, $3,417. Amount expended on sanitation, $85. B. G. Jenvey, Township Clerk, Ingersoll.

Paipoonge, Tp.—Owns and operates telephone system, cost $3,000. Good opening for agricultural implements. Number of buildings erected, 30; cost $62,775. Amount expended on permanent improvements, $10,000. J. Thornton, Township Clerk, Stanley.

Paisley, V.—Owns and operates waterworks for fire protection, cost $6,500. Good opening for carpet factory. No new buildings erected. Amount expended on permanent improvements, $500. Amount expended on sanitation, $315. J. C. Gibson, Village Clerk, Paisley.

Pakenham, Tp.—Good opening for agricultural implement factory. Num-

ber of buildings erected, 5; cost $5,000. Amount expended on permanent improvements, $1,327. J. Connery, Township Clerk, Pakenham.

PALMERSTON, Tn.—Owns and operates waterworks, cost $50,000; electric light plant, cost $17,000. Good opening for woodworking industries. Number of buildings erected, 5; cost $10,000. Amount expended on permanent improvements, $1,500. Amount expended on sanitation, $1,000. H. Hyndman, Town Clerk, Palmerston.

PALMERSTON AND NORTH AND SOUTH CANONTO, Tps.—Good opening for mining industries. No new buildings erected. Amount expended on permanent improvements, $2,000. James Geddes, Township Clerk, Snow Road.

PAPINEAU, Tp.—Number of buildings erected, 2; cost $1,000. C. A. Fink, Township Clerk, Mattawa.

PARIS, Tn.—Owns and operates waterworks, value, $92,000; electric light plant, value $79,000. Openings for various industries. Number of buildings erected, 50; cost $75,000. Amount expended on permanent improvements, $4,000. Amount expended on sanitation, $200. T. McCosh, Town Clerk, Paris.

PARKE, Tp.—See Korah and Parke Tps.

PARKHILL, Tn.—Owns and operates waterworks, cost $30,000. Good opening for various industries. No new buildings erected. J. H. Laughton, Town Clerk, Parkhill.

PARRY SOUND, Tn.—Owns and operates waterworks, value $65,165; electric light plant, value $81,644. Good openings for iron works, woodworking factory, etc. Number of buildings erected, 12; cost $477,000. Amount expended on permanent improvements, $3,000. E. E. Armstrong, Town Clerk, Parry Sound.

PEEL, Tp.—Number of buildings erected, 2; cost $3,000. Amount expended on permanent improvements, $2,151. Amount expended on sanitation, $284. Edward Gainer, Township Clerk, Arthur.

PELEE, Tp.—Owns and operates telephone system, cost $6,500. Good openings for canning factory, tobacco factory, cement blocks, tile, sewer pipe, lumber and builders' supplies. Number of buildings erected, 22; cost $22,150. Amount expended on permanent improvements, $2,537. W. Stewart, Township Clerk, Pelee Island.

PELHAM, Tp.—Brass works started. Number of buildings erected, 25; cost $38,000. Amount expended on permanent improvements, $6,000. Amount expended on sanitation, $113. A. M. Armbrust, Township Clerk, Ridgeville.

PEMBROKE, Tn.—Steel equipment and shook mills started. Owns and operates waterworks, cost $150,000. Good opening for electrical supplies, all kinds of woodworking industries. Number of buildings erected, 120; cost $300,000. Amount expended on permanent improvements, $12,000. Amount expended on sanitation, $5,000. A. J. Fortier, Town Clerk, Pembroke.

PEMBROKE, Tp.—Good opening for woodworking industries, brick and tile works, foundry. Number of buildings erected, 6; cost $8,000. Amount expended on permanent improvements, $219. H. W. Perrett, Township Clerk, Pembroke.

PENETANGUISHENE, Tn.—Fibre products factory started. Owns and operates waterworks, cost $46,000; electric light and power plant, cost $24,000. Good opening for knitting factory. Number of buildings erected, 12; cost $12,000. Amount expended on permanent improvements, $1,000. Amount expended on sanitation, $1,082. W. H. Hewson, Town Clerk, Penetanguishene.

PERCY, Tp.—Good opening for canning factory. Number of buildings erected, 5; cost $10,000. Amount expended on permanent improvements, $3,000. Amount expended on sanitation, $100. P. S. Ewing, Township Clerk, Warkworth.

PERRY, Tp.—Good opening for flour mill. Number of buildings erected, 2; cost $2,000. Amount expended on permanent improvements, $1,096. W. R. Wayward, Township Clerk, Scotia.

PERTH, Tn.—Cigar factory started. Owns and operates street lighting system, value $14,000. Openings for industries of any character. No new buildings erected. Amount expended on permanent improvements, $11,000. Amount expended on sanitation, $2,562. J. A. Kerr, Town Clerk, Perth.

PETERBOROUGH, C.—Marble works started. Owns and operates waterworks, value $572,389. Openings for industries of any character. Number of buildings erected, 310; cost $488,540. Amount expended on permanent improvements, $46,982. Amount expended on sanitation, $17,659. S. R. Armstrong, City Clerk, Peterborough.

PETEWAWA, Tp.—Good opening for pulp and paper mill. Number of buildings erected, 5; cost $8,000. Amount expended on permanent improvements, $200. E. Giesebraht, Township Clerk, Petewawa.

PETROLEA, Tn.—Owns and operates waterworks, cost $190,430. Good opening for planing mill. Number of buildings erected, 4: cost $15,000. Amount expended on permanent improvements, $17,700. Amount expended on sanitation, $5,902. J. McHattie, Town Clerk, Petrolea.

PICKERING, Tp.—Good opening for canning factory. Number of buildings erected, 18; cost $40,000. Amount expended on permanent improvements, $13,513. Amount expended on sanitation, $1,430. D. R. Beaton, Township Clerk, Whitevale.

PICTON, Tn.—Owns and operates waterworks and electric light plant, cost $65,000. Good openings for industries of any character. Number of buildings erected, 10; cost $125,000. Amount expended on permanent improvements, $7,000. Amount expended on sanitation, $300. H. C. Macull, Town Clerk, Picton.

PILKINGTON, Tp.—Number of buildings erected, 5; cost $6,800. Amount expended on permanent improvements, $2,690. Geo. F. Cromar, Township Clerk, Elora.

PITTSBURGH, Tp.—One new building erected, cost $800. Amount expended on permanent improvements, $2,592. Amount expended on sanitation, $24. W. Murray, Township Clerk, Barriefield.

PLANTAGENET N., Tp.—Number of buildings erected, 18: cost $25,000. Amount expended on permanent improvements, $2,000. Amount expended on sanitation, $300. D. M. Viau, Township Clerk, Plantagenet.

PLANTAGENET S., Tp.—Sash and door factory, general store started. Good opening for sugar factory, tin and iron roofing factory. Number of buildings erected, 34; cost $48,000. Amount expended on permanent improvements, $8,100. Amount expended on sanitation, $85. W. N. Dunning, Township Clerk, Riceville.

PLUMMER (Additional) Tp.—Mining industry started. Good opening for saw mills, pulp mills, trap rock crushers, etc. Number of buildings erected, 6; cost $4,000. Amount expended on permanent improvements, $1,459. N. H. Peterson, Township Clerk, Bruce Mines.

PLYMPTON, Tp.—Good opening for blacksmith. Number of buildings erected, 4; cost $4,500. Amount expended on permanent improvements, $5,809. Thos. Nisbet, Township Clerk, Wyoming.

Point Edward, V.—Openings for industries of any character. Number of buildings erected, 2; cost $2,000. Amount expended on permanent improvements, $2,000. David Suhler, Village Clerk, Point Edward.

Port Arthur, C.—Railway frog and switch works, milling industry started. Owns and operates waterworks, value $1,015,941; electric light plant, value $550,640; telephone system, value $274,214; street railway, value $857,022. Good openings for woodworking industries, iron and steel industries and all subsidiary industries and by-products, brick, sewer pipe, etc., grain elevator, flour mills and all grain by-products. Number of buildings erected, 612; cost $1,935,680. Amount expended on permanent improvements, $28,481. Amount expended on sanitation, $310,862. T. F. Milne, City Clerk, Port Arthur.

Port Carling, V.—Number of buildings erected, 3; cost $1,500. Amount expended on permanent improvements, $961. Amount expended on sanitation, $59. F. D. Stubbs, Village Clerk, Port Carling.

Port Colborne, V.—Owns and operates waterworks, cost $48,000. Good opening for iron industries. Number of buildings erected, 100; cost $160,000. Amount expended on permanent improvements, $4,017. D. Alair, Village Clerk, Port Colborne.

Port Dalhousie, V.—Canning factories started. Owns and operates electric light plant, cost $10,600. Good openings for industries of any character. Number of buildings erected, 5; cost $6,000. Amount expended on permanent improvements, $861. Amount expended on sanitation, $40. J. M. A. Waugh, Village Clerk, Port Dalhousie.

Port Dover, V.—Canning factory started. Openings for foundry, lumber yards, furniture factory, etc. Number of buildings erected, 7; cost $6,000. Amount expended on permanent improvements, $3,522. Amount expended on sanitation, $350. J. Sloan, Village Clerk, Port Dover.

Port Elgin, V.—Owns and operates waterworks, cost $42,000. Good openings for industries of any character. No new buildings erected. Amount expended on permanent improvements, $400. D. Geddes, Village Clerk, Port Elgin.

Port Hope, Tn.—Chemical factory started. Owns and operates waterworks, cost $120,000. Good openings for wood or iron industries, clothing and specialties. Number of buildings erected, 26; cost $140,000. Amount expended on permanent improvements, $4,183. Amount expended on sanitation, $5,865. J. W. Sanders, Town Clerk, Port Hope.

Port Perry, V.—Owns and operates waterworks and electric light plant, value $30,000. Openings for various industries. Number of buildings erected, 4; cost $34,000. Amount expended on permanent improvements, $1,000. Amount expended on sanitation, $15. W. H. Harris, Village Clerk, Port Perry.

Port Rowan, V.—One new building erected, cost $1,200. W. A. Mabee, Village Clerk, Port Rowan.

Port Stanley, V.—Owns and operates waterworks, cost $24,872; electric light plant, cost $17,758. Openings for industries of any character. Number of buildings erected, 20; cost $20,000. Amount expended on permanent improvements, $4,874. J. S. Robertson, Village Clerk, Box 13, St. Thomas.

Portland, Tp.—Number of buildings erected, 10; cost $13,000. Amount expended on permanent improvements, $5,539. Amount expended on sanitation, $81. T. A. Kerr, Township Clerk, Harrowsmith.

Portsmouth, V.—Owns and operates electric light plant, cost $600. One

new building erected, cost $1,600. Amount expended on permanent improvements, $800. J. W. Henstridge, Village Clerk, Portsmouth.

Powassan, Tn.—Good openings for hub factory, woodworking industries. Number of buildings erected, 3; cost $3,000. Amount expended on permanent improvements, $800. Amount expended on sanitation, $600. L. G. Phillips, Town Clerk, Powassan.

Prescott, Tn.—Marine supply factory started. Owns and operates waterworks, value $75,000; electric light plant, value $20,000. Number of buildings erected, 6; cost $20,000. Amount expended on permanent improvements, $1,200. Amount expended on sanitation, $100. G. Rook, Town Clerk, Prescott.

Preston, Tn.—Chair factory, bronze and brass works started. Owns and operates waterworks, value $128,000; electric light plant, value $91,000. Openings for various industries. Number of buildings erected, 150; cost $500,000. Amount expended on permanent improvements, $25,000. Amount expended on sanitation, $20,000. H. C. Edgar, Town Clerk, Preston.

Prince, Tp.—Owns and operates telephone system, cost $600. No new buildings erected. Amount expended on permanent improvements, $1,253. W. H. Wilson, Township Clerk, Steelton.

Proton, Tp.—Amount expended on permanent improvements, $6,246. T. Laughlin, Township Clerk, Dundalk.

Puslinch, Tp.—Number of buildings erected, 6; cost $10,000. Amount expended on permanent improvements, $425. Amount expended on sanitation, $73. A. B. Falconbridge, Township Clerk, Aberfoyle.

Radcliffe, Tp.—Opening for saw mill, shoemaker. No new buildings erected. J. E. H. Miller, Township Clerk, Combermere.

Raglan, Tp.—Saw mill started. Good opening for mining industry. One new building erected, cost $500. Amount expended on permanent improvements, $38. C. F. Schmelzle, Township Clerk, Jewellville.

Rainham, Tp.—Number of buildings erected, 11; cost $12,500. Amount expended on permanent improvements, $900. L. F. Culver, Township Clerk, Rainham.

Rainy River, Tn.—Owns and operates waterworks, cost $35,000. Good openings for flour mills or woodworking plant. Number of buildings erected, 3; cost $4,000. Amount expended on permanent improvements, $2,300. Amount expended on sanitation, $249. E. E. Less, Town Clerk, Rainy River.

Raleigh, Tp.—Opening for porous tile factory. Number of buildings erected, 25; cost $1,575. Amount expended on permanent improvements, $2,250. A. E. Robinson, Township Clerk, Charing Cross.

Rama, Tp.—Number of buildings erected, 3; cost $2,200. Amount expended on permanent improvements, $1,400. W. M. Shields, Township Clerk, O'Connell.

Ramsay, Tp.—Number of buildings erected, 3; cost $4,000. Amount expended on permanent improvements, $5,357. Amount expended on sanitation, $140. T. A. Thompson, Township Clerk, Almonte.

Rawdon, Tp.—Good opening for canning factory. Number of buildings erected, 4; cost $2,000. W. F. Bateman, Township Clerk, Spring Brook.

Rayside, Tp.—Opening for butter and cheese factory. Number of buildings erected, 4; cost $1,600. Amount expended on permanent improvements, $1,400. E. Joliat, Township Clerk, Boninville.

Reach, Tp.—Number of buildings erected, 18; cost $22,000. Amount expended on permanent improvements, $5,000. Amount expended on sanitation, $42. W. F. Dobson, Township Clerk, Manchester.

Renfrew, Tn.—Electric factory started. Owns and operates waterworks, cost $145,324; power plant, cost $179,521. Good opening for foundry and machine shop. Number of buildings erected, 50; cost $200,000. Amount expended on permanent improvements, $28,778. Amount expended on sanitation, $2,074. J. A. Devenny, Town Clerk, Renfrew.

Richards, Tp.—See Hagarty and Richards Tps.

Richmond, Tp.—Number of buildings erected, 2; cost $3,000. Amount expended on permanent improvements, $1,800. James McKittrick, Township Clerk, Selby.

Richmond W., V.—Owns and operates lighting system, cost $5,765. Good openings for saw mill, flour mill, shingle mill, grain elevator. Number of buildings erected, 5; cost $7,000. Amount expended on permanent improvements, $464. J. Rielly, Village Clerk, Richmond West.

Richmond Hill, V.—Four greenhouses started. Owns and operates electric light system, value $9,000. Good openings for factories. Number of buildings erected, 20; cost $45,000. Amount expended on permanent improvements, $5,000. A. J. Hume, Village Clerk, Richmond Hill.

Ridgetown, Tn.—Owns and operates waterworks, cost $38,000; electric light plant, cost $12,000. Number of buildings erected, 5; cost $12,000. Amount expended on permanent improvements, $5,000. D. Cochrane, Town Clerk, Ridgetown.

Ridout, Tp.—See McLean and Ridout Tps.

Rochester, Tp.—Owns and operates telephone system, value $20,560. Good openings for canning factories, milk condensing plants. Number of buildings erected, 4; cost $6,000. Amount expended on permanent improvements, $10,001. Amount expended on sanitation, $3,914. M. N. Mousseau, Township Clerk, South Woodslie.

Rockland, Tn.—Good opening for carriage factory, brick and cement works. Number of buildings erected, 14; cost $7,700. Amount expended on permanent improvements, $3,000. Amount expended on sanitation, $150. J. N. Lagrois, Town Clerk, Rockland.

Roddick, Tp.—See Alberton and Roddick Tps.

Rodney, V.—Good opening for canning factory, foundry. One new building erected, cost $6,000. Amount expended on permanent improvements, $500. J. D. Shaw, Village Clerk, Rodney.

Rolph, Buchanan and Wylie, Tps.—Number of buildings erected, 2; cost $600. Amount expended on permanent improvements, $500. Florence McCarthy, Township Clerk, Wylie.

Romney, Tp.—Good opening for canning factory. Number of buildings erected, 10; cost $20,000. Amount expended on permanent improvements, $2,000. J. W. Kennedy, Township Clerk, Wheatley.

Ross, Tp.—Granite works started. Good openings for industries of any character. Number of buildings erected, 10; cost $10,000. Amount expended on permanent improvements, $2,000. P. R. Pounder, Township Clerk, Forester's Falls.

Roxborough, Tp.—Number of buildings erected, 20; cost $15,000. Amount expended on permanent improvements, $2,721. F. D. Brunet, Township Clerk, Moose Creek.

Russell, Tp.—Number of buildings erected, 20; cost $40,000. Amount ex-

pended on permanent improvements, $20,000. Amount expended on sanitation, $4,000. W. R. Craig, Township Clerk, Russell.

Ryde, Tp.—No new buildings erected. Amount expended on permanent improvements, $287. W. Tingey, Township Clerk, Gravenhurst.

Ryerson, Tp.—No new buildings erected. F. Medcalf, Township Clerk, Burk's Falls.

St. Catharines, C.—Canning factory, tool works, flax mill, axes and tool factory, greenhouses, boilers, etc., started. Owns and operates waterworks, cost $520,000; gas plant, cost $100,000; electric light plant, cost $116,000. Openings for industries of any character. Number of buildings erected, 405; cost $760,000. Amount expended on permanent improvements, $266,585. Amount expended on sanitation, $78,765. J. A. Pay, City Clerk, St. Catharines.

St. Edmunds, Tp.—Good opening for saw mills. No new buildings erected. Amount expended on permanent improvements, $1,413. Amount expended on sanitation, $79. L. Spears, Township Clerk, Tobermory.

St. Joseph, Tp.—Rock crushing works started. Number of buildings erected, 9; cost $9,600. Amount expended on permanent improvements, $2,482. Amount expended on sanitation, $100. H. M. Ross, Township Clerk, Richard's Landing.

St. Mary's, Tn.—Owns and operates waterworks, cost $70,000; electric light plant, $60,000. Good openings for various industries. Number of buildings erected, 24; cost $52,000. T. M. Clark, Town Clerk, St. Mary's.

St. Thomas, C.—Biscuit factory started. Owns and operates waterworks, cost $329,964; electric light plant, cost $113,926; gas works, cost $194,356; street railway, cost $75,000. Opening for any kind of iron industry. W. B. Doherty, City Clerk, St. Thomas.

St. Vincent, Tp.—No new buildings erected. G. G. Albery, Township Clerk, Meaford.

Salter, May and Harrow, Tps.—Openings for industries of any character. Number of buildings erected, 7; cost $3,000. Amount expended on permanent improvements, $300. Oscar Cole, Township Clerk, Massey.

Saltfleet, Tp.—Number of buildings erected, 15; cost $35,000. Amount expended on permanent improvements, $2,000. Erland Lee, Township Clerk, Stoney Creek.

Sandfield, Tp.—Good opening for sash and door factory, shingle and lath mill. No new buildings erected. Amount expended on permanent improvements, $608. T. W. Thomson, Township Clerk, Big Lake.

Sandwich, Tn.—Openings for manufacturing industries of any character. Number of buildings erected, 49; cost $126,725. Amount expended on permanent improvements, $36,165. Amount expended on sanitation, $30,723. E. R. North, Town Clerk, Sandwich.

Sandwich E., Tp.—Metallic cartridge factory, canning factory started. Openings for various industries. Number of buildings erected, 26; cost $8,000. Amount expended on permanent improvements, $30,000. Louis Laramie, Township Clerk, Tecumseh.

Sandwich S., Tp.—Owns and operates telephone system, cost $15,000. Good opening for canning factories. Number of buildings erected, 12; cost $7,300. Amount expended on permanent improvements, $6,753. Amount expended on sanitation, $27. J. A. McAuliffe, Township Clerk, Maidstone.

Sandwich, W., Tp.—Owns and operates telephone system, cost $6,000. Good openings for industries of any character. Number of buildings erected, 64; cost

$57,600. Amount expended on permanent improvements, $8,000. Amount expended on sanitation, $1,572. E. Bondy, Township Clerk, Canard River

Sarawak, Tp.—Number of buildings erected, 2; cost $2,400. Amount expended on permanent improvements, $858. Amount expended on sanitation, $53. W. Morton, Township Clerk, East Linton.

Sarnia, C.—Stove factory, planing mill started. Owns and operates waterworks, cost $225,000. Openings for various industries. Number of buildings erected, 70; cost $157,300. Amount expended on permanent improvements, $19,931. Amount expended on sanitation, $4,163. J. D. Stewart, City Clerk, Sarnia.

Saugeen, Tp.—Number of buildings erected, 17; cost $10,000. Amount expended on permanent improvements, $2,050. Amount expended on sanitation, $49. F. W. Elliott, Township Clerk, Port Elgin

Sault Ste. Marie, C.—Good openings for woodworking industries. Number of buildings erected, 190; cost $385,036. Amount expended on permanent improvements, $108,446. Amount expended on sanitation, $40,632. C. J. Pim, City Clerk, Sault Ste. Marie.

Scarborough, Tp.—Brick yards started. Good opening for sand brick industry. Number of buildings erected, 50; cost $150,000. Amount expended on permanent improvements, $4,000. W. D. Annis, Township Clerk, Scarborough.

Schreiber, Tp.—Number of buildings erected, 19; cost $41,000. Amount expended on permanent improvements, $556. Amount expended on sanitation, $156. G. A. Evans, Township Clerk, Schreiber.

Scott, Tp.—Number of buildings erected, 2; cost $4,000. Amount expended on permanent improvements, $3,204. Amount expended on sanitation, $650. Allan Gray, Township Clerk, Uxbridge.

Scugog, Tp.—Number of buildings erected, 3; cost $2,800. Amount expended on permanent improvements, $300. T. Graham, Township Clerk, Port Perry.

Seaforth, Tn.—Butter factory started. Owns and operates waterworks, cost $14,500; electric light plant, cost $25,000. Good openings for cold storage plant, linen mill, woollen mill. One new building erected, cost $6,000. Amount expended on sanitation, $900. J. A. Wilson, Town Clerk, Seaforth.

Sebastopol, Tp.—Number of buildings erected, 3; cost $3,000. Amount expended on permanent improvements, $48. C. Walther, Township Clerk, Vanbrugh.

Seneca, Tp.—Opening for blacksmith and carriage maker. Number of buildings erected, 3; cost $4,000. Amount expended on permanent improvements, $2,388. Amount expended on sanitation, $58. N. H. Wickett, Township Clerk, York.

Seymour, Tp.—Openings for industries of any character, No new buildings erected. Amount expended on permanent improvements, $8,607. J. B. Ferris, Township Clerk, Campbellford.

Shallow Lake, V.—Good openings for furniture factory, cement factory, stone quarry. No new buildings erected. Amount expended on permanent improvements, $140. Amount expended on sanitation, $30. R. E. Young, Village Clerk, Shallow Lake.

Sheffield, Tp.—Good opening for brick yard. Number of buildings erected, 15; cost $2,500. Amount expended on permanent improvements, $1,803. J. Aylesworth, Township Clerk, Tamworth.

Shelburne, V.—Owns and operates waterworks, value $32,500. Good open-

ings for shoe factory, woollen mills, whitewear factory, overall and pant factory, No new buildings erected. Amount expended on permanent improvements, $1,200. Amount expended on sanitation, $700. T. Whatley, Village Clerk, Shelburne.

Sherbrooke, Tp.—Number of buildings erected, 2; cost $2,000. Amount expended on permanent improvements, $390. Amount expended on sanitation, $52. L. McCallum, Township Clerk, Stromness.

Sherbrooke, N., Tp.—See Dalhousie and Sherbrooke N., Tps.

Sherbrooke S., Tp.—Good opening for pulp mill. Number of buildings erected, 3; cost $3,000. Amount expended on permanent improvements, $200. H. J. Buchanan, Township Clerk, Maberly.

Sherwood, Jones and Burns, Tps.—Number of buildings erected, 3; cost $900. S. E. Smith, Township Clerk, Barry's Bay.

Shuniah, Tp.—Number of buildings erected, 15; cost $7,000. Amount expended on permanent improvements, $10,000. H. A. McKibbon, Township Clerk, Port Arthur.

Sidney, Tp.—Openings for industries of any character. Number of buildings erected, 8; cost $8,000. Amount expended on permanent improvements, $5,649. Amount expended on sanitation, $477. A. M. Chapman, Township Clerk, Belleville.

Simcoe, Tn.—Owns and operates waterworks, value $90,000. Good opening for tin plate factory and box factory. Number of buildings erected, 31; cost $60,000. Amount expended on permanent improvements, $11,600. Amount expended on sanitation, $181,000. C. D. McCall, Town Clerk, Simcoe.

Sioux-Lookout, Tn.—Good opening for lumber mill, brick yard. Number of buildings erected, 40; cost $35,000. Amount expended on permanent improvements, $1,800. Amount expended on sanitation, $67. P. Discher, Town Clerk, Sioux-Lookout.

Smith, Tp.—Number of buildings erected, 10; cost $7,600. Amount expended on permanent improvements, $3,809. Amount expended on sanitation, $92. J. W. Kelly, Township Clerk, Bridgenorth.

Smith's Falls, Tn.—Owns and operates waterworks, cost $200,000. Number of buildings erected, 79; cost $222,060. Amount expended on permanent improvements, $120,122. Amount expended on sanitation, $26,954. J. A. Lewis, Town Clerk, Smith's Falls.

Snowdon, Tp.—Number of buildings erected, 2; cost $800. Amount expended on permanent improvements, $950. A. J. Scott, Township Clerk, Gelert.

Sombra, Tp.—Openings for industries of various descriptions. Number of buildings erected, 4; cost $4,000. Amount expended on permanent improvements, $1,500. Amount expended on sanitation, $300. W. A. Scott, Township Clerk, Wilkesport.

Somerville, Tp.—Opening for cheese factory. Number of buildings erected, 9; cost $8,000. Amount expended on permanent improvements, $1,975. A. B. Townsend, Township Clerk, Burnt River.

Sophiasburg, Tp.—Number of buildings erected, 4; cost $8,000. Amount expended on permanent improvements, $1,721. C. H. Wright, Township Clerk, Demorestville.

Southampton, Tn.—Owns and operates waterworks, cost $43,617. Good opening for woodworking industries. Number of buildings erected, 4; cost $1,400. Amount expended on permanent improvements, $797. Amount expended on sanitation, $1,401. J. C. Eckford, Town Clerk, Southampton.

South River, V.—Good opening for butter and cheese factory, chair industry. One new building erected, cost $900. Amount expended on permanent improvements, $269. H. B. Naismith, Village Clerk, South River.

Southwold, Tp.—Number of buildings erected, 6; cost $8,500. Amount expended on permanent improvements, $15,845. J. C. McLennan, Township Clerk, Fingal.

Springer, Tp.—Number of buildings erected, 10; cost $5,000. Amount expended on permanent improvements, $2,000. O. Lafrance, Township Clerk, Sturgeon Falls.

Springfield, V.—Milk condensing industry started. Number of buildings erected, 2; cost $35,000. Amount expended on permanent improvements, $5,000. J. B. Lucas, Village Clerk, Springfield.

Stafford, Tp.—Number of buildings erected, 14; cost $11,000. Amount expended on permanent improvements, $1,352. J. Kidd, Township Clerk, Cobden.

Stamford, Tp.—Owns and operates waterworks, cost $10,000. Good openings for industries of any description. Number of buildings erected, 45; cost $110,000. Amount expended on permanent improvements, $9,000. C. S. Monroe, Township Clerk, South End.

Stanhope, Tp.—No new buildings erected. W. Cooper, Township Clerk, Boskung.

Stanley, Tp.—Amount expended on permanent improvements, $3,000. Amount expended on sanitation, $135. R. J. Richardson, Township Clerk, Varna.

Stayner, Tn.—Owns and operates waterworks, value $35,000; electric light plant, value $9,000. Good openings for canning factory, boot and shoe factory, etc. Number of buildings erected, 2; cost $11,500. Amount expended on permanent improvements, $518. Amount expended on sanitation, $20. J. Hood, Town Clerk, Stayner.

Steelton, Tn.—Extensions to Algoma Steel Co. started. Owns and operates waterworks, value $84,667; electric light plant, value $30,000. Good opening for furniture factory, stair works, glass works. Number of buildings erected, 60; cost $75,000. Amount expended on permanent improvements, $17,470. Amount expended on sanitation, $2,554. J. Robinson, Town Clerk, Steelton.

Stephen, Tp.—Good opening for canning factory. One new building erected, cost $2,000. Amount expended on permanent improvements, $2,500. Henry Eilber, Township Clerk, Crediton.

Stephenson, Tp.—Saw mill started. Number of buildings erected, 8; cost $8,000. Amount expended on permanent improvements, $1,237. Daniel Bain, Township Clerk, Utterson.

Stirling, V.—Owns and operates electric light plant, value $12,292. Openings for canning factory. Number of buildings erected, 3; cost $4,700. Amount expended on permanent improvements, $351. C. H. Luery, Village Clerk, Sterling.

Stisted, Tp.—No new buildings erected. Amount expended on permanent improvements, $665. W. H. Demaine, Township Clerk, Etwell.

Storrington, Tp.—Number of buildings erected, 3; cost $1,500. Amount expended on permanent improvements, $4,000. H. J. Moreland, Township Clerk, Sunbury.

Stouffville, V.—Owns and operates waterworks, cost $28,000; electric light plant, cost $5,000. Good openings for any kind of industries. One new building erected, cost $3,500. Amount expended on permanent improvements, $650. J. Urquhart, Village Clerk, Stouffville.

STRATFORD, C.—Furniture factory, brass works started. Owns and operates waterworks, cost $270,000; electric light plant, cost $179,000. Good opening for carriage and waggon factory, agricultural implement factory, stove and furnace factory, carpet factory, boot and shoe factory, whitewear factory. Number of buildings erected, 118; cost $200,000. Amount expended on permanent improvements, $60,000. Amount expended on sanitation, $50,000. R. R. Lang, City Clerk, Stratford.

STRATHROY, Tn.—Owns and operates waterworks and electric light plant, cost $66,000. Good opening for woodworking industries, boot and shoe factory, woollen mill. Number of buildings erected, 11; cost $13,900. Amount expended on permanent improvements, $4,555. Amount expended on sanitation, $550. F. W. Atkinson, Town Clerk, Strathroy.

STREETSVILLE, V.—Owns and operates waterworks, cost, $6,500; electric light plant, cost $27,000. Good openings for brick factory, canning factories. Number of buildings erected, 2; cost $5,000. Amount expended on sanitation, $20. S. H. Smith, Village Clerk, Streetsville.

STRONG, Tp.—Good openings for grist mill, brick yard, cement plant. Number of buildings erected, 4; cost $4,000. Amount expended on permanent improvements, $1,800. Amount expended on sanitation, $75. A. M. Church, Township Clerk, Sundridge.

STURGEON FALLS, Tn.—Owns and operates waterworks, cost $44,376. Openings for flour mill, lumber mill, etc. Number of buildings erected, 4; cost $7,000. Amount expended on permanent improvements, $2,054. Amount expended on sanitation, $1,367. J. D. Cockburn, Town Clerk, Sturgeon Falls.

STURGEON, POINT, V.—No new buildings erected. Amount expended on sanitation, $161. G. H. Hopkins, Village Clerk, Lindsay.

SUDBURY, Tn.—Owns and operates waterworks, cost $214,267; electric light plant, cost $75,000. Openings for various industries. Number of buildings erected, 271; cost $723,385. Amount expended on permanent improvements, $10,000. Amount expended on sanitation, $50,000. W. Ross, Town Clerk, Sudbury.

SULLIVAN, Tp.—Number of buildings erected, 5; cost $11,500. Amount expended on permanent improvements, $3,463. A Stephen, Township Clerk, Marmion.

SUNDRIDGE, V.—Good opening for woodworking industry. Number of buildings erected, 3; cost $3,000. Amount expended on permanent improvements, $200. J. Harper, Village Clerk, Sundridge.

SUNNIDALE, Tp.—Opening for cement works. Number of buildings erected, 4; cost $2,400. Amount expended on permanent improvements, $4,800. Amount expended on sanitation, $80. T. F. Burrows, Township Clerk, Stayner.

SUTTON, V.—Good opening for woollen mill, canning factory. Number of buildings erected, 12; cost $16,000. Amount expended on permanent improvements, $800. Amount expended on sanitation, $60. F. G. Tremayne, Township Clerk, Sutton West.

SYDENHAM, Tp.—Number of buildings erected, 13; cost $9,500. Amount expended on sanitation, $300. J. M. Thomson, Township Clerk, Bognor.

TARA, V.—Openings for industries of any character. No new buildings erected. Amount expended on permanent improvements, $533. Amount expended on sanitation, $75. W. J. Taylor, Village Clerk, Tara.

TARBUTT AND TARBUTT ADDITIONAL, Tps.—Good opening for general black-

smith. Number of buildings erected, 4; cost $2,500. Amount expended on permanent improvements, $1,050. R. H. Barr, Township Clerk, MacLennan.

TARENTORUS, Tp.—Number of buildings erected, 12; cost $25,000. Amount expended on permanent improvements, $5,790. B. R. McMullin, Township Clerk, Sault Ste. Marie.

TAVISTOCK, V.—Owns and operates waterworks, value $23,000. Openings for industries of any character. Number of buildings erected, 3; cost $8,000. Amount expended on permanent improvements, $1,300. J. G. Field, Village Clerk, Tavistock.

TAY, Tp.—Planing mill started. Good openings for industries requiring electric power and water fronts. Number of buildings erected, 38; cost $4,500. Amount expended on permanent improvements, $2,800. T. Brown, Township Clerk, Victoria Harbour.

TECUMSETH, Tp.—Good opening for creamery. Number of buildings erected, 15; cost $18,000. Amount expended on permanent improvements, $2,000. W. Lilly, Township Clerk, Beeton.

TEESWATER, V.—Owns and operates waterworks for fire protection only, cost about $15,000. Good opening for woodworking industries, foundry. Number of buildings erected, 5; cost $5,000. Amount expended on permanent improvements, $500. Amount expended on sanitation, $200. J. Farquharson, Village Clerk, Teeswater.

TEHKUMMAH, Tp.—Good opening for butter factory. Number of buildings erected, 2; cost $2,200. Amount expended on permanent improvements. $1,025. Amount expended on sanitation. $500. J. E. Hopkins, Township Clerk, Tehkummah.

THAMESVILLE, V.—Creamery started. Owns and operates waterworks, cost $12,000; electric light plant, cost $6,500. Openings for packing house, pickle factory, etc. One new building erected, cost $2,000. Amount expended on permanent improvements, $200. W. J. Cryderman, Village Clerk, Thamesville.

THEDFORD, V.—Good opening for canning factory. Number of buildings erected, 3; cost $25,500. Amount expended on permanent improvements, $950. W. Brooks, Village Clerk, Thedford.

THESSALON, Tn.—Owns and operates waterworks and electric light plant, cost $42,000. Good openings for woodworking industries. No new buildings erected. Amount expended on permanent improvements, $150. Amount expended on sanitation, $75. E. G. Scott, Town Clerk, Thessalon.

THESSALON, Tp.—Good opening for furniture factory. Number of buildings erected, 2; cost $2,000. Amount expended on permanent improvements, $827. Amount expended on sanitation, $33. T. E. Clinton, Township Clerk, Thessalon.

THOMPSON, Tp.—Blacksmith shop started. Good opening for woodworking industry. Number of buildings erected, 5; cost $700. Amount expended on permanent improvements, $150. T. W. Baker, Township Clerk, Dean Lake.

THORNBURY, Tn.—Owns and operates waterworks and electric light plant, cost $30,000. Good openings for various industries. One new building erected, cost $2,500. E. Rorke, Town Clerk, Thornbury.

THOROLD, Tn.—Owns and operates waterworks, cost $100,000; electric light plant, cost $50,000. Openings for industries requiring water or electric power. Number of buildings erected, 20; cost $40,000. Amount expended on permanent improvements, $29,425. Amount expended on sanitation, $14,682. D. J. C. Munro, Town Clerk, Thorold.

THOROLD, Tp.—Good opening for canning factory, steel works, etc. Number of buildings erected, 20; cost $100,000. Amount expended on permanent improvements, $2,000. J. A. Clark, Township Clerk, Fonthill.

THURLOW, Tp.—Good openings for tannery, canning factories, flour mills, etc. Number of buildings erected, 25; cost $10,000. Amount expended on permanent improvements, $2,000. Amount expended on sanitation, $100. C. A. Callery, Township Clerk, Canifton.

TILBURY, Tn.—Rubber factory started. Owns and operates waterworks and electric light plant, cost $10,500. Openings for beet sugar factory, broom factory, basket factory. Number of buildings erected, 30; cost $18,000. Amount expended on permanent improvements, $600. Amount expended on sanitation, $872. W. A. Dutton, Town Clerk, Tilbury.

TILBURY E., Tp.—Brick and drainage tile works, market gardens started. Good opening for sugar beet factories. Amount expended on permanent improvements, $7,772. Amount expended on sanitation, $4,092. A. Farquharson, Township Clerk, Merlin.

TILBURY N., Tp.—Number of buildings erected, 12; cost $12,000. Amount expended on permanent improvements, $3,000. J. A. Tremblay, Township Clerk, Tilbury.

TILBURY, W., Tp.—Owns and operates waterworks, cost $500; gas lighting plant, cost $600; telephone system, cost $22,000. Number of buildings erected, 17; cost $20,000. Amount expended on permanent improvements, $750. Amount expended on sanitation, $68. S. T. Anderson, Township Clerk, Comber.

TILLSONBURG, Tn.—Boot and shoe factory, car shops started. Owns and operates waterworks, cost $35,000; electric light plant, cost $30,000. Openings for industries of any character. Number of buildings erected, 15; cost $50,000. Amount expended on permanent improvements, $7,158. A. E. Raynes, Town Clerk, Tillsonburg.

TINY, Tp.—Number of buildings erected, 10; cost $13,600. Amount expended on permanent improvements, $3,500. M. Beaudoin, Township Clerk, Lafontaine.

TIVERTON, V.—No new buildings erected. Amount expended on permanent improvements, $250. Amount expended on sanitation, $10. R. N. Blair, Village Clerk, Tiverton.

TORBOLTON, Tp.—Good opening for brick and tile works. Number of buildings erected, 5; cost $4,000. D. B. McLaren, Township Clerk, Woodlawn.

TORONTO, C.—Owns and operates waterworks, cost $10,793,128; electric light plant, cost $5,650,000; civic car lines, cost $1,200,000. Openings for all kinds of industries. Number of buildings erected, 9,884; cost $27,038,624. Amount expended on permanent improvements, $3,406,186. Amount expended on sanitation, $2,594,999. W. A. Littlejohn, City Clerk, Toronto.

TORONTO, Tp.—Brick factory started. No new buildings erected. C. H. Gill, Township Clerk, Dixie.

TORONTO GORE, Tp.—No new buildings erected. Amount expended on permanent improvements, $1,500. Amount expended on sanitation, $92. N. Harrison, Township Clerk, Castlemore.

TOSSORONTIO, Tp.—Number of buildings erected, 6; cost $5,500. Amount expended on permanent improvements, $3,000. T. Irwin, Township Clerk, Lisle.

TOWNSEND, Tp.—Butter factory started. Good opening for tile and brick yard. Number of buildings erected, 10; cost $20,000. Amount expended on

permanent improvements, $3,035. Amount expended on sanitation, $50. J. Ross, Township Clerk, Waterford.

TRAFALGAR, Tp.—Opening for brick yard. Number of buildings erected, 20; cost $60,000. Amount expended on permanent improvements, $25,000. C. Hall, Township Clerk, Trafalgar.

TRENTON, Tn.—Creosote factory started. Good openings for industries requiring electric power. Number of buildings erected, 80; cost $100,000. G. W. Ostrom, Town Clerk, Trenton.

TROUT CREEK, Tn.—Good opening for woodworking industry. No new buildings erected. Amount expended on permanent improvements, $700. B. E. Green, Town Clerk, Trout Creek.

TUCKERSMITH, Tp.—Owns and operates telephone system, value $39,600. Number of buildings erected, 5; cost $9,000. Amount expended on permanent improvements, $5,072. D. F. McGregor, Township Clerk, Seaforth.

TUDOR AND CASHEL, Tps.—Good opening for mining. Number of buildings erected, 2; cost $1,000. Amount expended on permanent improvements, $1,207. Amount expended on sanitation, $50. W. Glennie, Township Clerk, Millbridge.

TURNBERRY, Tp.—Number of buildings erected, 2; cost $2,000. Amount expended on permanent improvements, $8,000. Amount expended on sanitation, $70. P. Powell, Township Clerk, Wingham.

TWEED, V.—Good openings for woodworking industries. Number of buildings erected, 3; cost, $8,000. Amount expended on permanent improvements, $1,500. Amount expended on sanitation, $200. W. W. Garrett, Village Clerk, Tweed.

TYENDINAGA, Tp.—Good opening for cheese factory, grist mill, etc. Number of buildings erected, 9; cost $4,650. Amount expended on permanent improvements, $2,870. P. O'Shaughnessy, Township Clerk, Melrose.

USBORNE, Tp.—Number of buildings erected, 6; cost $8,500. Amount expended on permanent improvements, $4,124. Amount expended on sanitation, $76. F. Morley, Township Clerk, Granton.

UXBRIDGE, Tn.—Good opening for shoe factory, furniture factory. No new buildings erected. Amount expended on sanitation, $375. M. H. Crosby, Town Clerk, Uxbridge.

UXBRIDGE, Tp.—Number of buildings erected, 2; cost $3,000. Amount expended on permanent improvements, $3,372. Amount expended on sanitation, $370. J. H. Millard, Township Clerk, Altona.

VAN HORNE, Tp.—Openings for flour, grist and chopping mills, butter or cheese factory. Number of buildings erected, 9; cost $2,500. Amount expended on permanent improvements, $650. T. Marshall, Township Clerk, Dryden.

VANKLEEK HILL, Tn.—Openings for carriage factory, gasoline engine factory. Number of buildings erected, 4; cost $4,000. Amount expended on permanent improvements, $900. Amount expended on sanitation, $100. W. I. Dunning, Town Clerk, Vankleek Hill.

VAUGHAN, Tp.—Amount expended on permanent improvements, $17,011. J. B. McLean, Township Clerk, Maple.

VERULAM, Tp.—No new buildings erected. Amount expended on permanent improvements, $2,955. G. W. Taylor, Township Clerk, Bobcaygeon.

VESPRA, Tp.—Owns and operates telephone system, cost $7,000. Openings for glass factory or cement works. Number of buildings erected, 25; cost $30,000.

Amount expended on permanent improvements, $5,250. Amount expended on sanitation, $114. A. B. Coutts, Township Clerk, Barrie.

Victoria Harbour, V.—Openings for box factory, cement works, launch and boat factory, chopping mill. Number of buildings erected, 5; cost, $2,500. Amount expended on permanent improvements, $2,406. Amount expended on sanitation, $52. E. B. Brown, Village Clerk, Victoria Harbour.

Vienna, V.—Number of buildings erected, 5; cost $3,000. Amount expended on permanent improvements, $557. S. S. Clutton, Village Clerk, Vienna.

Wainfleet, Tp.—Number of buildings erected, 20; cost $20,000. Amount expended on permanent improvements, $3,063. J. Henderson, Jr., Township Clerk, Marshville.

Walkerton, Tn.—Saddlery, hardware and brass goods factory, foundry and repair shop started. Owns and operates waterworks, cost $45,000. Good openings for industries of any character. Number of buildings erected, 6; cost, $15,000. Amount expended on permanent improvements, $2,500. Amount expended on sanitation, $100. J. H. Scott, Town Clerk, Walkerton.

Walkerville, Tn.—Automobile factory, windshields factory, electric stove works, chemical plant, loose leaf factory, banking institution, printing establishment started. Owns and operates incinerator, cost $30,000; electric light plant, cost $58,000. Openings for industries of any character. Number of buildings erected, 143; cost $508,000. Amount expended on permanent improvements, $120,000. C. H. Robinson, Town Clerk, Walkerville.

Wallace, Tp.—Number of buildings erected, 7; cost, $3,000. Amount expended on permanent improvements, $3,500. Amount expended on sanitation, $250. D. Greer, Township Clerk, Gowanstown.

Wallaceburg, Tn.—Openings for industries of any character. Number of buildings erected, 25; cost, $57,400. Amount expended on permanent improvements, $14,400. H. E. Johnson, Town Clerk, Wallaceburg.

Walpole, Tp.—Opening for brick and tile yard, cement works. Number of buildings erected, 18; cost $25,800. Amount expended on permanent improvements, $8,729. Amount expended on sanitation, $233. S. A. Thompson, Township Clerk, Nanticoke.

Walsingham, N., Tp.—Number of buildings erected, 8; cost, $6,000. Amount expended on permanent improvements, $2,674. Amount expended on sanitation, $60. E. J. Hodson, Township Clerk, Langton.

Walsingham, S., Tp.—Jam factory started. Number of buildings erected, 7; cost $9,300. Amount expended on permanent improvements, $5,000. W. M. Townsend, Township Clerk, Walsingham.

Wardsville, V.—Openings for saw mill, grist mill, evaporator. No new buildings erected. Amount expended on permanent improvements, $672. G. E. Corneille, Village Clerk, Wardsville.

Warwick, Tp.—Amount expended on permanent improvements, $7,000. N. Herbert, Township Clerk, Watford.

Waterdown, V.—Jam factory started. Openings for milling and gristing industries, printing establishment. Number of buildings erected, 4; cost $6,000. Amount expended on permanent improvements, $1,346. Amount expended on sanitation, $25. J. C. Medlar, Village Clerk, Waterdown.

Waterford, V.—Owns and operates electric light plant, cost $5,600. Good opening for sash and door factory, machine shop. Number of buildings erected,

2; cost $3,000. Amount expended on permanent improvements, $1,533. J. Ross, Village Clerk, Waterford.

Waterloo, Tn.—Owns and operates waterworks, cost $110,449; gas works, cost $47,949; electric light plant, cost $69,085. Good openings for industries of any character. Number of buildings erected, 69; cost $236,000. Amount expended on permanent improvements, $25,000. Amount expended on sanitation, $14,650. J. C. Haight, Town Clerk, Waterloo.

Waterloo, Tp.—Owns and operates telephone system, cost $18,000. Number of buildings erected, 120; cost $70,000. Amount expended on permanent improvements, $14,000. G. A. Tilt, Township Clerk, Blair.

Waters, Tp.—Brick yard started. Good opening for cheese and butter factories. Number of buildings erected, 3; cost $1,500. Amount expended on permanent improvements, $306. P. G. Gaudrault, Township Clerk, Copper Cliff.

Watford, V.—Openings for knitting factory, foundry and machine shop, canning factory, etc. Number of buildings erected, 8; cost $22,300. W. S. Fuller, Village Clerk, Watford.

Watt, Tp.—Saw mill started. Number of buildings erected, 7; cost, $5,300. Amount expended on permanent improvements, $500. W. J. Hammell, Township Clerk, Raymond.

Wawanosh, E., Tp.—Number of buildings erected, 5; cost, $2,900. Amount expended on permanent improvements, $1,947. A. Porterfield, Township Clerk, Belgrave.

Wawanosh, W., Tp.—No new buildings erected. Amount expended on permanent improvements, $3,197. Amount expended on sanitation, $113. W. A. Wilson, Township Clerk, Lucknow.

Webbwood, Tn.—Opening for woodworking industry. No new buildings erected. Amount expended on permanent improvements, $862. Amount expended on sanitation, $664. T. Brinsmead, Town Clerk, Webbwood.

Welland, Tn.—Steel and metal works started. Owns and operates waterworks, cost $212,000; electric light plant, cost $65,000. Good openings for industries requiring electric power. Number of buildings erected, 287; cost $611,157. Amount expended on permanent improvements, $163,464. Amount expended on sanitation, $18,401. C. M. Webber, Town Clerk, Welland.

Wellesley, Tp.—Number of buildings erected, 11; cost $6,000. Amount expended on permanent improvements, $10,834. Amount expended on sanitation, $845. P. F. Schummer, Township Clerk, St. Clements.

Wellington, V.—Canning factory started. Openings for various industries. Number of buildings erected, 14; cost $18,100. Amount expended on permanent improvements, $1,510. Amount expended on sanitation, $5. E. A. Titus, Village Clerk, Wellington.

West Lorne, V.—Foundry started. Owns and operates fire engine, cost $1,000. Good opening for furniture factory. Number of buildings erected, 6; cost $4,157. Amount expended on permanent improvements, $990. Amount expended on sanitation, $157. J. S. Robertson, Village Clerk, St. Thomas.

Westmeath, Tp.—Number of buildings erected, 11; cost $7,100. Amount expended on permanent improvements, $4,987. Hugh S. Miller, Township Clerk, Beachburg.

Westminster, Tp.—Amount expended on permanent improvements, $9,668. Amount expended on sanitation, $96. G. Riddell, Township Clerk, Wilton Grove.

Weston, V.—Owns and operates waterworks, cost $90,000; electric light plant, cost $30,000. Good openings for various industries. Number of buildings erected, 30; cost $60,000. Amount expended on permanent improvements, $2,500. Amount expended on sanitation, $90,000. J. H. Taylor, Village Clerk, Weston.

Westport, V.—One new building erected, cost $2,000. W. S. Ripley, Village Clerk, Westport.

Whitby, Tn.—Owns and operates waterworks and electric light plant, cost $114,000. Good opening for factories of any description. Number of buildings erected, 7; cost $21,700. Amount expended on permanent improvements, $6,300. J. White, Town Clerk, Whitby.

Whitby, Tp.—Good opening for apple evaporator, jam factory. No new buildings erected. Amount expended on permanent improvements, $2,000. Amount expended on sanitation, $100. D. Holliday, Township Clerk, Brooklin.

Whitby, E., Tp.—Cement works started. Good opening for blacksmith Number of buildings erected, 10; cost $10,000. Amount expended on permanent improvements, $10,000. W. Purvis, Township Clerk, Columbus.

Whitchurch, Tp.—Number of buildings erected, 7; cost $8,000. Amount expended on permanent improvements, $4,286. W. H. Clark, Township Clerk, Stouffville.

Whitney, Tp.—No new buildings erected. F. M. Baker, Township Clerk, Porcupine.

Wiarton, Tn.—Owns and operates waterworks, cost $51,000. Good openings for woodworking industries, cement plant, foundry, woollen mill. No new buildings erected. Amount expended on permanent improvements, $1,150. Amount expended on sanitation, $1,250. J. H. Fielding, Town Clerk, Wiarton.

Wicklow, Tp.—See Bangor Tp.

Widdifield, Tp.—Brick yard started. Number of buildings erected, 16; cost $7,800. Amount expended on permanent improvements, $836. J. A. Carmichael, Township Clerk, North Bay.

Wilberforce and Algoma, N., Tps.—Good opening for cement works. No new buildings erected. T. McKibbon, Township Clerk, Eganville.

Williams, E., Tp.—Concrete tile and cement block works started. One new building erected, cost $12,000. Amount expended on permanent improvements, $4,619. W. McCallum, Township Clerk, Ailsa Craig.

Williams, W., Tp.—Good opening for cheese factory. No new buildings erected. Amount expended on permanent improvements, $2,751. W. Dawson, Township Clerk, Park Hill.

Williamsburg, Tp.—Good opening for barrel factory, sash and door factory. Number of buildings erected, 5; cost $900. Amount expended on permanent improvements, $8,293. George Lane, Township Clerk, Williamsburg.

Willoughby, Tp.—Number of buildings erected, 4; cost $4,000. J. A. Plyley, Township Clerk, Chippawa.

Wilmot, Tp.—The police village of Baden in this township owns and operates hydro-electric lighting plant, cost $6,500. Opening for foundry. Number of buildings erected, 16; cost $20,000. Amount expended on permanent improvements, $14,977. Amount expended on sanitation, $175. F. Holwell, Township Clerk, Baden.

Winchester, V.—Owns and operates hydro-electric system, cost $10,500. Opening for foundry, condensed milk factory, or any industry requiring power.

One new building erected, cost $2,000. Amount expended on permanent improvements, $3,010. Amount expended on sanitation, $311. W. J. Laflamme, Village Clerk, Winchester.

WINCHESTER, Tp.—Number of buildings erected, 11; cost $14,500. Amount expended on permanent improvements, $10,114. Amount expended on sanitation, $103. G. Elliot, Township Clerk, Chesterville.

WINDHAM, Tp.—Opening for canning factory. Number of buildings erected, 2; cost $1,000. Amount expended on permanent improvements, $5,822. J. T. Camfield, Township Clerk, Windham Centre.

WINDSOR, C.—Cartridge factory, wheel works, crucible steel works, steel process works, overall factory, motor works, adding machine plant, shirt and tie factory started. Owns and operates waterworks, cost $492,000; electric light plant, cost $30,000. Openings for all kinds of industries. Number of buildings erected, 400; cost $1,148,000. Amount expended on permanent improvements, $225,000. Amount expended on sanitation, $76,235. S. Lusted, City Clerk, Windsor.

WINGHAM, Tn.—Owns and operates waterworks, value $51,000; electric light plant, value $45,000. Openings for industries of any character. Number of buildings erected, 9; cost $30,200. Amount expended on permanent improvements, $19,000. Amount expended on sanitation, $1,200. J. F. Groves, Town Clerk, Wingham.

WOLFE ISLAND, Tp.—Owns and operates steam ferry, cost $20,000. No new buildings erected. Amount expended on permanent improvements, $2,000. D. J. Dawson, Township Clerk, Wolfe Island.

WOLFORD, Tp.—One new building erected, cost $1,500. Amount expended on permanent improvements, $3,400. G. W. Harris, Township Clerk, Jasper.

WOLLASTON, Tp.—Good opening for woodworking industries. Number of buildings erected, 2; cost $1,000. Amount expended on permanent improvements, $650. Alex. Miller, Township Clerk, Coe Hill.

WOOD, Tp.—See Medora and Wood Tps.

WOODBRIDGE, V.—Owns and operates street lamps, cost $60. Good opening for foundry, machine shop, woodworking factory. Number of buildings erected, 2; cost $4,000. Amount expended on permanent improvements, $933. E. Brown, Village Clerk, Woodbridge.

WOODHOUSE, Tp.—Stone crushing plant started. Openings for blacksmith, cement works, brick and tile plant, clay brick yard. Number of buildings erected, 9; cost $25,000. Amount expended on permanent improvements, $9,000. Amount expended on sanitation, $70. F. Bowlby, Township Clerk, Simcoe.

WOODSTOCK, C.—Oil tank and pump factory, textile factory, fire appliance factory started. Owns and operates waterworks, value $225,000; electric light plant, value $120,000. Openings for industries of any character. Number of buildings erected, 50; cost $200,000. Amount expended on permanent improvements, $21,000. Amount expended on sanitation, $8,670. J. Morrison, City Clerk, Woodstock.

WOODVILLE, V.—Sash and door factory started. Number of buildings erected, 2; cost $2,000. Amount expended on permanent improvements, $500. Amount expended on sanitation, $30. A. E. Staback, Village Clerk, Woodville.

WOOLWICH, Tp.—Number of buildings erected, 12; cost $12,100. Amount expended on permanent improvements, $10,900. W. J. Snider, Township Clerk, Conestogo.

WORTHINGTON AND BLUE, Tps.—Number of buildings erected, 3; cost, $1,800. Amount expended on permanent improvements, $1,322. H. Engebretson, Township Clerk, Sleeman.

WROXETER, V.—Owns and operates electric light plant, cost $1,900. J. Brethauer, Village Clerk, Wroxeter.

WYLIE, Tp.—See Rolph, Buchanan and Wylie, Tps.

WYOMING, V.—Saw mill started. Openings for box and basket factory, furniture factory, marble works, blacksmith. Number of buildings erected, 2; cost $2,700. Amount expended on permanent improvements, $200. H. G. Taylor, Village Clerk, Wyoming.

YARMOUTH, Tp.—Number of buildings erected, 23; cost, $30,000. Amount expended on permanent improvements, $18,859. Amount expended on sanitation, $7,000. W. C. Caughell, Township Clerk, St. Thomas.

YONGE, Front, Tp.—Number of buildings erected, 3; cost, $3,500. Amount expended on permanent improvements, $3,283. Amount expended on sanitation, $141. F. H. Mallory, Township Clerk, Mallorytown.

YONGE AND ESCOTT, Rear, Tps.—Good opening for cheese box factory, grinding mill, saw mill. Number of buildings erected, 2; cost $3,200. Amount expended on permanent improvements, $3,250. Amount expended on sanitation, $26. R. E. Cornell, Township Clerk, Athens.

YORK, Tp.—Number of buildings erected, 10; cost $1,500. Amount expended on permanent improvements, $69,800. Amount expended on sanitation, $11,985. W. A. Clarke, Township Clerk, 40 Jarvis St., Toronto.

ZONE, Tp.—No new buildings erected. George Bedford, Township Clerk, Bothwell.

ZORRA, E., Tp.—Opening for milk condensing factory, concrete tile factory. Number of buildings erected, 25; cost $12,500. Amount expended on permanent improvements, $11,000. Amount expended on sanitation, $255. J. Anderson, Township Clerk, Woodstock.

ZORRA, W., Tp.—Number of buildings erected, 17; cost $20,000. Amount expended on permanent improvements, $4,802. Amount expended on sanitation, $188. A. Murray, Township Clerk, Embro.

STATISTICS TABULATED.

The preceding returns by the municipal clerks, as far as statistics are concerned, have been tabulated as follows, thus giving a clear view of the expenditure on new buildings, permanent improvements and sanitation. The additional column, introduced six years ago, has been repeated, showing the public utilities owned and operated by the municipalities, with the capital thus invested, the continuous increase having been most satisfactory.

MUNICIPAL STATISTICS.

C., city; Tn., town; V., village; Tp., Township.

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
		$	$	$	$
Acton, V.	10	2,000	.....	200	8,500
Adelaide, Tp.	.....	.....	2,000	120	.....
Adjala, Tp.	.....	.....	5,000	100	.....
Admaston, Tp.	8	6,500	5,237	.....	.....
Adolphustown, Tp.	.....	.....	1,800	.....	.....
Ailsa Craig, V.	.....	.....	622	158	.....
Albemarle, Tp.	7	10,000	2,325	.....	1,000
Alberton, Tp.	3	3,000	718	.....	.....
Albion, Tp.	5	5,000	8,000	.....	.....
Aldborough, Tp.	10	10,000	13,000	.....	.....
Alexandria, Tn.	5	20,000	4,300	150	47,500
Alfred, Tp.	50	15,000	437	.....	.....
Algona, S., Tp.	2	200	6,000	.....	.....
Alice and Fraser, Tps.	10	4,500	267	.....	450
Alliston, Tn.	8	18,000	600	250	27,000
Almonte, Tn.	15	20,000	3,000	.....	40,000
Alnwick, Tp.	17	3,000	1,150	70	.....
Alvinston, V.	.....	.....	878	378	.....
Amabel, Tp.	50	25,000	4,000	.....	.....
Amaranth, Tp.	6	7,100	5,200	.....	.....
Ameliasburgh, Tp.	5	5,000	1,285	83	.....
Amherst Island, Tp.	2	2,200	756	.....	.....
Amherstburg, Tn.	8	10,000	950	850	64,500
Ancaster, Tp.	30	125,000	4,508	216	.....
Anderdon, Tp.	17	10,850	3,548	.....	.....
Anson and Hindon, Tps.	.....	.....	167	.....	.....
Arkona, V.	.....	.....	225	.....	.....
Armour, Tp.	4	8,000	.....	.....	.....
Arnprior, Tn.	7	7,000	111,282	50,425	94,000
Arran, Tp.	6	6,000	10,000	190	.....
Artemesia, Tp.	10	9,700	3,755	41	.....
Arthur, V.	4	5,000	900	68	.....
Arthur, Tp.	4	6,000	4,000	.....	.....
Ashfield, Tp.	10	10,000	7,032	55	.....
Assiginack, Tp.	8	8,000	3,500	50	.....
Athens, V.	2	10,500	.....	.....	.....
Athol, Tp.	5	4,000	449	.....	.....
Atwood, Tp.	.....	.....	487	.....	.....
Augusta, Tp.	4	7,000	5,972	300	.....
Aurora, Tn.	.....	.....	.....	.....	65,000
Aylmer, Tn.	10	51,000	60,000	4,000	130,000
Ayr, V.	2	5,000	415	500	8,000
Bagot and Blythfield, Tps.	6	6,000	1,200	25	.....
Balfour, Tp.	3	1,200	2,000	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No	$	$	$	$
Bangor, Tp.	50	4,000	758	150	.....
Barrie, Tn.	56	176,000	30,000	12,000	215,306
Barrie, Tp.	.....	.....	150	.....	.....
Barton, Tp.	30	30,000	57,642	1,555	.....
Bastard & Burgess, S., Tps.	1	2,500	6,654	251	.....
Bath, V.	2	1,800	473	.....	225
Bathurst, Tp.	12	1,500	750	50	.....
Bayfield, V.	7	2,000	575	.....	1,385
Bayham, Tp.	8	25,000	200	.....	.....
Beamsville, V.	17	22,000	1,600	.....	27,000
Beaverton, V.	2	3,000	1,069	714	10,000
Beckwith, Tp.	3	3,000	1,000	.....	1,000
Bedford, Tp.	5	4,000	2,000	.....	.....
Beeton, V.	1	1,000	500	100	24,000
Belle River, V.	7	3,100	497	.....	.....
Belleville, C.	400	400,000	6,000	2,500	296,180
Belmont and Methuen, Tps.	4	2,000	2,090	.....	.....
Bentinck, Tp.	10	15,000	5,100	210	.....
Berlin, C.	271	651,871	200,000	35,000	936,450
Bertie, Tp.	63	60,000	6,969	231	.....
Beverly, Tp.	7	8,700	7,698	.....	.....
Bexley, Tp.	1	400	1,200	.....	.....
Biddulph, Tp.	15	15,000	6,620	59	.....
Billings, Tp.	1	800	1,500	.....	.....
Binbrook, Tp.	4	10,000	3,202	.....	.....
Blandford, Tp.	.....	.....	3,513	106	.....
Blansbard, Tp.	3	8,000	7,338	.....	.....
Blenheim, Tn.	4	10,000	1,500	.....	12,000
Blenheim, Tp.	8	11,000	8,155	.....	.....
Blezard, Tp.	5	800	154	.....	.....
Blind River, Tn.	2	21,000	.....	.....	.....
Bloomfield, V.	.....	.....	400	.....	.....
Blue, Tp.	2	1,800	1,527	.....	.....
Blyth, V.	.....	.....	300	2,000	44,000
Bobcaygeon, V.	6	5,500	900	.....	25,000
Bolton, V.	2	5,000	.....	400	.....
Bonfield, Tn.	3	1,150	406	.....	.....
Bonfield, Tp.	16	20,000	1,600	.....	.....
Bosanquet, Tp.	8	7,400	9,593	.....	.....
Bothwell, Tn.	2	2,000	1,350	300	10,500
Bowmanville, Tn.	26	50,000	3,500	1,500	.....
Bracebridge, Tn.	4	13,000	4,000	500	180,000
Bradford, V.	3	5,500	1,000	.....	.....
Brampton, Tn.	50	125,000	25,000	6,000	205,000
Brant, Tp.	.....	.....	2,000	.....	.....
Brantford, C.	594	1,015,886	60,000	124,065	889,179
Brantford, Tp.	55	55,000	15,988	.....	.....
Bridgeburg, V.	15	25,000	10,000	8,000	40,000
Brighton, Tp.	3	6,000	1,000	.....	50,000
Brighton, V.	8	7,000	3,888	279	16,000
Brock, Tp.	4	10,000	7,745	243	.....
Brockville, Tn.	28	68,400	33,850	10,605	500,951
Bromley, Tp.	4	6,000	2,300	.....	.....
Brooke, Tp.	7	12,000	8,864	37	20,000
Brougham, Tp.	3	1,200	.....	.....	.....
Bruce, Tp.	.....	.....	8,223	.....	.....
Bruce Mines, Tn.	1	1,600	800	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Brudenell & Lynedoch, Tps.	40	28,000	143	.....	.....
Brunel, Tp.	4	2,000	644	.....	.....
Brussels, V.	.....	.....	.....	2,000	45,000
Bucke, Tp.	25	15,000	5,000	.....	.....
Burford, Tp.	14	15,000	11,455	100	.....
Burgess, N., Tp.	.....	.....	275	.....	.....
Burk's Falls, V.	3	3,000	761	.....	37,000
Burleigh & Anstruther, Tps.	2	1,000	130	.....	.....
Burlington, V.	40	90,000	15,000	4,067	60,000
Burpee, Tp.	.....	.....	355	.....	.....
Cache Bay, Tn.	1	800	644	28	.....
Caistor, Tp.	6	4,000	2,000	47	.....
Caldwell, Tp.	6	3,000	2,584	.....	.....
Caledon, Tp.	3	8,000	5,721	.....	.....
Caledonia, V.	25	50,000	1,200	200	5,000
Caledonia, Tp.	10	10,000	.....	800	.....
Calvin, Tp.	.....	.....	79	.....	.....
Cambridge, Tp.	11	5,000	7,130	.....	.....
Camden, Tp.	.....	.....	4,500	.....	.....
Camden, E., Tp.	7	10,000	3,700	.....	.....
Cameron, Tp.	.....	.....	.....	40	.....
Canborough, Tp.	6	10,000	1,449	.....	.....
Cannington, V.	3	3,500	400	.....	.....
Caradoc, Tp.	10	14,000	11,301	305	16,000
Carden, Tp.	2	500	606	.....	.....
Cardiff, Tp.	.....	.....	104	.....	.....
Cardinal, V.	3	2,500	1,027	175	.....
Cardwell, Tp.	1	600	175	.....	.....
Carleton Place, Tn.	5	30,000	4,517	72,000	.....
Carlow, Tp.	4	2,000	1,000	25	.....
Carnarvon, Tp.	.....	.....	1,950	.....	.....
Carrick, Tp.	15	60,000	6,000	50	.....
Cartwright, Tp.	3	2,000	1,628	27	.....
Casselman, V.	5	9,400	948	123	5,000
Cassimer, Jennings & Appleby, Tps.	4	1,300	1,600	450	.....
Cavan, Tp.	23	18,000	7,058	53	.....
Cayuga, V.	6	15,000	1,789	.....	.....
Cayuga, N., Tp.	12	12,000	2,800	.....	.....
Cayuga, S., Tp.	5	3,000	200	6	.....
Chaffey, Tp.	11	6,500	2,102	.....	.....
Chamberlain, Tp.	3	1,000	.....	.....	.....
Chandos, Tp.	4	1,150	142	.....	3,000
Chapleau, Tp.	50	69,000	1,082	294	48,000
Chapman, Tp.	.....	.....	1,996	.....	.....
Chapple, Tp.	.....	.....	3,478	.....	.....
Charlottenburg, Tp.	10	10,000	10,000	.....	.....
Charlotteville, Tp.	6	10,500	2,638	4,250	.....
Chatham, C.	151	308,310	46,289	11,126	278,458
Chatham, Tp.	10	12,000	1,500	.....	.....
Chatsworth, V.	.....	.....	547	21	.....
Chelmsford, Tn.	5	5,000	.....	.....	.....
Chesley, Tn.	1	300	1,000	120	48,000
Chesterville, V.	2	3,500	3,358	67	5,000
Chinguacousy, Tp.	6	7,000	5,000	.....	30,000
Chisholm, Tp.	4	2,400	772	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Chippewa, V.	3	3,500	600	.....	1,050
Christie, Tp.	1	500	.....	.....	.....
Clarence, Tp.	100	50,000	.....	1,005	.....
Clarendon & Miller, Tps.	2	750	700	100	.....
Clarke, Tp.	12	40,000	7,250	144	.....
Clifford, V.	3	27,200	640	.....	3,500
Clinton, Tn.	2	2,000	2,115	.....	95,000
Clinton, Tp.	14	14,900	7,000	.....	.....
Cobalt, Tn.	56	91,400	37,842	8,041	101,108
Cobden, V.	3	4,000	300	.....	.....
Cobourg, Tn.	29	39,550	3,172	3,170	.....
Cochrane, Tn.	15	50,000	1,100	11,500	90,000
Cockburn Island, Tp.	2	800	458	.....	.....
Colborne, V.	4	15,000	1,815	.....	.....
Colborne, Tp.	.....	.....	2,000	.....	.....
Colchester, N., Tp.	15	34,000	8,049	.....	11,836
Colchester, S., Tp.	14	18,100	3,914	12	.....
Coldwater, V.	.....	.....	1,177	.....	23,000
Coleman, Tp.	.....	.....	59,699	340	.....
Collingwood, Tp.	11	33,850	6,000	1,400	125,798
Collingwood, Tn.	.....	.....	6,187	.....	7,000
Conmee, Tp.	15	7,500	1,660	.....	.....
Copper Cliff, Tn.	13	81,000	1,890	2,846	.....
Cornwall, Tn.	25	25,000	10,000	.....	150,000
Cornwall, Tp.	5	7,000	6,000	580	.....
Courtright, V.	1	1,200	800	.....	.....
Cramahe, Tp.	5	3,050	4,152	115	.....
Creemore, V.	1	500	9,000	.....	25,000
Crosby, N., Tp.	1	1,000	860	35	.....
Crosby, S., Tp.	4	2,000	2,561	.....	.....
Crowland, Tp.	50	75,000	6,213	900	.....
Culross, Tp.	5	7,300	3,143	39	3,360
Cumberland, Tp.	31	26,000	4,000	.....	.....
Dalhousie and Sherbrooke, Tps.	10	4,000	1,313	.....	.....
Dalton, Tp.	2	1,600	600	.....	.....
Darling, Tp.	.....	.....	212	52	.....
Darlington, Tp.	.....	.....	7,540	24	.....
Dawn, Tp.	7	10,000	4,000	.....	12,000
Day & Bright Add., Tps.	3	600	.....	.....	.....
Delaware, Tp.	5	10,000	5,313	200	.....
Delhi, V.	9	30,000	1,514	69	.....
Denbigh, Abinger & Ashby, Tps.	4	1,200	227	.....	.....
Derby, Tp.	4	4,000	5,726	172	.....
Dereham, Tp.	.....	.....	14,897	339	.....
Deseronto, Tn.	3	6,500	1,616	1,219	67,300
Dilke, Tp.	2	500	1,108	.....	.....
Dorchester, N., Tp.	20	29,800	3,300	100	.....
Dorchester, S., Tp.	8	8,000	6,000	.....	.....
Douro, Tp.	8	8,200	1,018	38	.....
Dover, Tp.	12	10,200	2,435	200	3,500
Downie, Tp.	6	7,200	11,900	342	.....
Draper, Tp.	1	600	1,400	.....	.....
Drayton, V.	1	500	1,079	20	.....
Dresden, Tn.	1	6,000	2,092	303	31,900
Drummond, Tp.	5	6,000	.....	40	.....
Drury, Denison, etc., Tps.	17	50,000	1,282	1,294	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No	$	$	$	$
Dryden, Tn.	3	10,000	199	106	.....
Dumfries, N., Tp.	8	10,000	1,620	.....	.....
Dumfries, S., Tp.	8	20,000	5,610	91	3,000
Dummer, Tp.	.....	.....	1,121	38	.....
Dungannon, Tp.	2	1,000	900	.....	.....
Dundalk, V.	1	1,000	500	1,500	8,000
Dundas, Tn.	101	208,010	9,227	1,065	106,693
Dunn, Tp.	2	4,000	200	.....	.....
Dunnville, Tn.	54	92,300	21,796	.....	57,297
Dunwich, Tp.	5	10,000	5,500	.....	.....
Durham, Tn.	8	4,450	330	.....	.....
Dutton, V.	4	7,000	150	.....	.....
Dymond, Tp.	.....	.....	4,087	.....	.....
Dysart, etc., Tps.	25	12,500	.....	.....	500
Easthope, N., Tp.	15	8,500	4,555	.....	24,000
Easthope, S., Tp.	2	7,000	2,482	.....	.....
Eastnor, Tp.	6	4,700	2,614	.....	.....
Eastview, Tn.	35	210,000	.....	.....	.....
Edwardsburg, Tp.	30	4,000	4,694	46	.....
Egansville, V.	7	15,000	6,000	.....	.....
Egrémont, Tp.	4	4,000	3,302	163	.....
Ekfrid, Tp.	6	9,000	2,250	.....	.....
Elderslie, Tp.	12	14,000	9,947	99	.....
Eldon, Tp.	15	14,000	4,000	.....	.....
Elizabethtown, Tp.	15	37,000	10,283	108	.....
Ellice, Tp.	27	10,300	5,529	128	.....
Elma, Tp.	12	16,000	4,200	210	.....
Elmira, V.	20	40,000	2,800	.....	5,500
Elmsley, N., Tp.	2	1,800	800	65	.....
Elmsley, S., Tp.	1	100	528	.....	.....
Elora, V.	1	1,500	450	.....	.....
Elzevir and Grimsthorpe, Tps.	2	2,000	1,113	.....	.....
Embro, V.	.....	.....	350	.....	.....
Emily, Tp.	4	5,000	3,661	.....	.....
Emo, Tp.	10	12,000	4,522	.....	.....
Englehart, Tn.	5	20,500	600	100	.....
Enniskillen, Tp.	.....	.....	7,000	.....	.....
Ennismore, Tp.	20	10,000	80,	.....	.....
Eramosa, Tp.	21	20,000	6,982	360	6,000
Erin, V.	4	10,000	1,000	.....	.....
Erin, Tp.	10	10,000	1,000	74	.....
Ernesttown, Tp.	.....	.....	4,773	271	.....
Escott, Front of, Tp.	.....	.....	200	.....	.....
Esquesing, Tp.	20	25,000	12,000	.....	.....
Essa, Tp.	5	3,000	7,433	96	.....
Essex, Tn.	6	9,000	8,000	.....	35,000
Etobicoke, Tp.	100	200,000	15,000	.....	.....
Euphemia, Tp.	2	1,800	2,822	.....	.....
Euphrasia, Tp.	10	5,000	4,800	.....	15,000
Evanturel, Tp.	5	2,000	2,134	25	.....
Exeter, V.	14	18,000	4,317	406	28,234
Faraday, Tp.	.....	.....	1,000	.....	.....
Fenelon, Tp.	15	16,200	2,059	.....	.....
Fenelon Falls, V.	3	4,400	1,500	.....	53,131
Fergus, V.	25	40,000	3,817	200	54,000
Ferris, Tp.	21	12,700	333	85	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Finch, V.	2	7,000	525	.....	.....
Finch, Tp.	7	10,000	7,986	455	.....
Fitzroy, Tp.	8	12,900	2,500	.....	85,000
Flamboro, E., Tp.	9	25,600	9,000	208	.....
Flamboro, W., Tp.	5	7,500	5,200	986	.....
Flesherton, V.	1	1,500	458	.....	.....
Flos, Tp.	.....	.....	3,000	.....	25,000
Foley, Tp.	.....	.....	1,184	.....	.....
Ford City, V.	10	20,000	16,563	1,660	.....
Forest, Tn.	12	21,900	2,129	32	39,000
Fort Erie, V.	7	18,000	7,083	.....	64,000
Fort Frances, Tn.	101	220,000	17,749	12,117	112,866
Fort William, C.	400	4,000,000	200,000	125,000	2,289,650
Fredericksburg, N., Tp.	3	3,200	610	51	.....
Fredericksburg, S., Tp.	4	3,500	1,067	.....	.....
Fullarton, Tp.	8	11,700	6,000	.....	.....
Gainsborough, Tp.	8	14,500	500	25	.....
Galt, Tn.	256	523,014	40,950	41,564	412,355
Galway & Cavendish, Tps.	1	700	320	.....	.....
Gananoque, Tn.	12	83,850	3,812	71	150,000
Garafraxa, E., Tp.	.....	.....	16,000	25	.....
Garafraxa, W., Tp.	3	5,500	500	.....	.....
Garden Island, V.	.....	.....	446	.....	.....
Georgetown, V.	20	55,000	8,000	100	67,000
Georgina, Tp.	7	10,000	6,501	.....	.....
Glamorgan, Tp.	4	1,125	500	.....	.....
Glanford, Tp.	8	15,000	1,400	31	.....
Glencoe, V.	9	12,800	800	400	11,000
Glenelg, Tp.	2	1,000	5,067	147	.....
Gloucester, Tp.	2	1,359	6,000	500	5,000
Goderich, Tn.	21	58,000	5,207	2,088	125,956
Goderich, Tp.	9	13,500	2,000	.....	12,000
Gordon, Tp.	5	2,050	1,300	.....	.....
Gore Bay, Tn.	1	1,000	1,028	.....	2,500
Gosfield, N., Tp.	12	17,600	.....	30	18,850
Gosfield, S., Tp.	36	46,850	6,630	.....	.....
Goulburn, Tp.	4	3,325	3,785	68	.....
Gower, N., Tp.	5	6,500	9,300	56	.....
Gower, S., Tp.	.....	.....	1,131	.....	.....
Grand Valley, V.	2	3,500	310	16	.....
Grantham, Tp.	25	100,000	10,377	45	.....
Grattan, Tp.	4	8,000	300	100	.....
Gravenhurst, Tn.	.....	.....	1,000	.....	120,000
Greenock, Tp.	3	5,000	6,233	.....	.....
Grey, Tp.	2	7,000	7,099	.....	.....
Griffith & Matawatchan, Tps.	1	510	350	.....	.....
Grimsby, N., Tp.	5	11,000	5,413	128	.....
Grimsby, S., Tp.	3	1,500	3,435	.....	.....
Guelph, C.	172	357,335	34,475	12,000	1,065 899
Guelph, Tp.	13	315,000	5,936	.....	.....
Gwillimbury, E., Tp.	6	12,000	4,000	.....	.....
Gwillimbury, N., Tp.	18	21,000	4,500	.....	.....
Gwillimbury, W., Tp.	1	1,400	1,069	94	.....
Hagar, Tp.	.....	.....	99	.....	.....
Hagarty & Richards, Tps.	4	1,000	606	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
		$	$	$	$
Hagerman, Tp.	6	3,600	600	50	.....
Hagersville, V.	8	20,000	1,000	.....	8,000
Haileybury, Tn.	7	15,000	2,952	2,257	134,733
Haldimand, Tp.	40	50,000	8,000	116	.....
Hallam, Tp.	4	1,500	4,000	.....	.....
Hallowell, Tp.	5	2,650	1,818	.....	.....
Hamilton, C.	2,019	5,110 000	774,145	229,169	4,211,156
Hamilton, Tp.	2	2,000	13,425	152	2,000
Hanmer, Tp.	4	500	1,029	.....	.....
Hanover, Tn.	75	125,000	4,025	.....	35,350
Harley, Tp.	3	4,000	3,300	60	.....
Harris, Tp.	19	3,500	2,881	.....	.....
Harriston, Tn.	2	6,000	600	.....	46,000
Harvey, Tp.	.....	.....	991	.....	.....
Harwich, Tp.	13	20,000	14,000	.....	.....
Hastings, V.	1	1,500	500	.....	.....
Havelock, V.	4	11,000	2,250	.....	.....
Hawkesbury, Tn.	35	1,575,000	1,500	50,100	135,000
Hawkesbury, E., Tp.	15	10,000	8,362	.....	.....
Hawkesbury, W., Tp.	20	15,000	1,600	.....	.....
Hay, Tp.	1	1,000	7,014	.....	20,000
Head, Maria & Clara, Tps.	.....	.....	800	.....	.....
Hensall, V.	.....	.....	400	.....	.....
Hepworth, V.	.....	.....	183	.....	.....
Hespeler, Tn.	4	18,000	4,320	.....	29,219
Hibbert, Tp.	.....	.....	6,580	409	.....
Hilliard, Tp.	.....	.....	1,701	.....	.....
Hillier, Tp.	6	8,700	1,862	.....	.....
Hilton, Tp.	3	1,500	1,605	.....	.....
Himsworth N., Tp.	4	4,500	1,521	.....	.....
Himsworth S., Tp.	6	2,700	300	.....	.....
Hichinbrooke, Tp.	15	18,000	3,300	.....	.....
Holland, Tp.	.....	.....	2,613	214	.....
Holland Landing, V.	.....	.....	485	.....	.....
Hope Tp.	5	5,500	7,208	180	.....
Horton Tp.	4	4,200	1,200	.....	.....
Houghton, Tp.	1	1,400	2,560	68	.....
Howard, Tp.	.....	.....	.....	.....	.....
Howe Island, Tp.	3	1,000	300	.....	.....
Howick, Tp.	.....	.....	7,779	99	7,873
Howland, Tp.	2	1,500	2,000	.....	.....
Hudson, Tp.	7	4,500	2,180	61	.....
Hullett, Tp.	4	9,000	8,695	.....	.....
Humberstone, V.	50	102,500	2,807	11	.....
Humberstone, Tp.	18	27,300	2,309	88	.....
Humphrey, Tp.	.....	.....	3,000	.....	.....
Hungerford, Tp.	50	75,000	1,000	.....	.....
Huntingdon, Tp.	4	3,000	700	.....	.....
Huntley, Tp.	3	3,500	3,982	.....	.....
Huntsville, Tn.	1	8,000	700	.....	53,728
Huron, Tp.	11	16,000	8,968	168	40,000
Ignace, Tp.	5	6,000	794	.....	.....
Ingersoll, Tn.	15	80,000	.....	.....	225,000
Innisfil, Tp.	11	12,000	5,400	580	.....
Iroquois, V.	1	4,000	800	.....	40,000
Jaffray and Melick, Tps.	10	3,500	1,500	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
James, Tp.	.....	.....	520	.....	.....
Jarvis, V.	4	7,000	600	.....	.....
Jocelyn, Tp.	.....	.....	900	.....	.....
Johnson, Tp.	4	1,300	600	.....	3,029
Joly, Tp.	2	1,200	244	.....	.....
Kaladar, Anglesea, etc., Tps.	.....	.....	834	.....	.....
Kearney, Tn.	.....	.....	250	135	700
Keewatin, Tn.	4	3,500	1,522	.....	.....
Kemptville, V.	5	20,000	1,300	.....	.....
Kennebec, Tp.	.....	.....	1,682	.....	.....
Kenora, Tn.	10	100,000	6,000	1,500	781,121
Keppel, Tp.	10	9,200	3,696	181	.....
Kerns, Tp.	2	1,000	2,600	.....	.....
Killaloe Station, V.	1	1,000	.....	45	.....
Kincardine, Tn.	.....	.....	2,500	80	72,421
Kincardine, Tp.	4	5,000	7,750	.....	.....
King, Tp.	28	5,200	11,589	196	9,500
Kingston, C.	190	604,800	89,500	10,750	708,148
Kingston, Tp.	30	11,000	8,669	150	.....
Kingsville, Tn.	17	20,400	4,500	86	33,000
Kinloss, Tp.	1	1,000	3,609	.....	.....
Kitley, Tp.	4	4,000	5,931	.....	.....
Korah and Parke, Tps.	16	21,900	6,500	.....	.....
Laird, Tp.	10	9,800	1,157	.....	6,000
Lakefield, V.	.....	.....	1,500	100	.....
Lanark, V.	2	6,800	1,689	.....	.....
Lanark, Tp.	3	1,050	909	53	.....
Lancaster, V.	8	14,400	900	.....	.....
Lancaster, Tp.	7	30,000	1,049	.....	.....
Latchford, Tn.	.....	.....	33	.....	.....
Lavallee, Tp.	6	3,100	3,144	50	.....
Lavant, Tp.	2	1,000	94	.....	.....
Laxton, Digby and Longford Tps.	6	4,000	1,500	.....	.....
Leamington, Tn.	70	105,000	18,896	3,607	52,500
Leaside, Tn.	.....	.....	40,000	.....	80,000
Leeds and Lansdowne F., Tps.	5	6,500	12,786	112	.....
Leeds and Lansdowne R., Tps.	8	8,000	3,600	.....	.....
Limerick, Tp.	.....	.....	1,364	.....	.....
Lindsay, Tn.	35	50,000	107,500	28,000	128,631
Lindsay, Tp.	2	1,500	2,007	.....	.....
Listowel, Tn.	2	5,000	5,500	.....	66,470
Little Current, Tn.	12	13,000	1,200	.....	.....
Lobo, Tp.	10	15,000	9,725	75	.....
Lochiel, Tp.	10	12,000	8,000	150	.....
Logan, Tp.	.....	.....	12,321	.....	.....
London, C.	100	1,789,920	62,079	622,829	1,605,601
London, Tp.	100	100,000	23,427	166	.....
Longueuil, Tp.	.....	.....	112	.....	.....
Loughborough, Tp.	.....	.....	3,405	.....	.....
Louth, Tp.	32	52,875	4,139	.....	.....
Lucan, V.	.....	.....	.....	.....	5,000
Lucknow, V.	3	4,000	.....	.....	10,000
Luther E., Tp.	3	5,400	11,698	92	.....
Luther W., Tp.	.....	.....	2,036	74	.....
Lutterworth, Tp.	5	2,000	450	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
McDougall, Tp.	1	30,000	1,205	.....	.....
McGillivray, Tp.	20	24,500	10,000	.....	.....
McIrvine, Tp.	26	16,615	3,000	.....	1,000
McKellar, Tp.	6	4,000	269	94	.....
McKillop, Tp.	5	6,500	6,305	298	18,000
McKim, Tp.	13	2,600	3,229	139	.....
McLean and Ridout, Tps.	3	2,000	100	75	.....
McMurrich, Tp.	1	800	626	.....	.....
McNab, Tp.	4	8,500	4,000	.....	.....
Macaulay, Tp.	3	2,000	300	50	.....
Macdonald, Meredith, etc., Tps.	9	6,000	2,250	52	2,400
Machar, Tp.	4	3,300	396	30	.....
Machin, Tp.	3	1,800	2,500	.....	.....
Madoc, V.	3	33,000	500	.....	5,000
Madoc, Tp.	7	7,000	5,500	.....	.....
Maidstone, Tp.	60	60,000	4,393	258	13,995
Malahide, Tp.	.....	.....	9,000	50	.....
Malden, Tp.	.....	.....	2,640	.....	.....
Manvers, Tp.	4	2,900	2,470	411	.....
Mara, Tp.	6	10,000	11,000	.....	.....
March, Tp.	.....	.....	1,940	119	.....
Mariposa, Tp.	6	25,100	7,000	100	.....
Markham, V.	.....	.....	1,000	.....	15,000
Markham, Tp.	15	25,000	13,463	.....	.....
Marlborough, Tp.	.....	.....	798	.....	.....
Marmora and Lake, Tps.	.....	.....	1,733	.....	.....
Marmora, V.	1	1,200	250	.....	6,000
Martland, Tp.	11	2,200	1,000	.....	.....
Maryborough, Tp.	8	18,000	14,138	462	.....
Marysburgh N., Tp.	2	2,500	1,000	500	.....
Marysburgh S., Tp.	3	3,000	500	.....	.....
Massey, Tn.	2	3,000	254	.....	23,882
Matchedash, Tp.	.....	.....	1,000	.....	.....
Matheson, Tn.	10	5,500	80	.....	.....
Matilda, Tp.	5	10,000	8,634	.....	.....
Mattawa, Tn.	2	30,000	1,000	.....	.....
Mattawan, Tp	3	1,500	600	.....	.....
Maxville, V.	1	10,000	300	100	.....
Mayo, Tp.	2	1,000	600	55	.....
Meaford, Tn.	30	35,000	25,000	.....	40,000
Medonte, Tp.	15	15,000	5,000	.....	20,000
Medora and Wood, Tps.	9	10,000	5,086	358	.....
Melancthon, Tp.	15	20,000	12,000	30	.....
Merrickville, V.	2	1,400	1,200	1,075	.....
Merriton, V.	12	18,000	16,071	400	96,000
Mersea, Tp.	25	16,000	6,700	74	.....
Metcalfe, Tp.	5	5,000	4,000	.....	.....
Middleton, Tp.	.....	.....	7,183	.....	.....
Midland, Tn.	30	60,000	8,000	650	164,500
Millbrook, V.	2	20,000	800	.....	.....
Milton West, Tn.	20	40,000	16,000	100	58,319
Milverton, V.	8	12,000	3,000	.....	.....
Mimico, V.	30	60,000	9,850	220	20,000
Minden, Tp.	3	2,000	800	.....	.....
Minto, Tp.	3	5,000	5,362	.....	.....
Mitchell, Tn.	8	40,000	.....	.....	50,000
Monaghan N., Tp.	30	50,000	6,187	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Monaghan, S., Tp.	1	1,500	1,162	.....	.....
Monck, Tp.	22	30,000	2,865	85	.....
Mono, Tp.	2	2,000	4,279	51	.....
Montague, Tp.	8	7,000	2,500	.....	.....
Monteagle and Herschel, Tps.	.....	.....	2,500	150	.....
Moore, Tp.	6	5,000	10,000	.....	38,000
Morley, Tp.	10	8,000	4,300	.....	.....
Mornington, Tp.	8	11,500	15,492	.....	.....
Morris, Tp.	.....	.....	23,131	20	31,558
Morrisburg, V.	.....	.....	.....	.....	65,000
Morrison, Tp.	13	2,000	570	.....	.....
Mosa, Tp.	7	10,000	6,023	.....	.....
Moulton, Tp.	13	7,100	563	.....	.....
Mount Forest, Tn.	2	5,000	1,500	.....	50,000
Mountain, Tp.	5	12,000	4,128	.....	.....
Mulmur, Tp.	.....	.....	3,220	.....	.....
Murray, Tp.	4	6,000	4,585	.....	.....
Muskoka, Tp.	.....	.....	1,571	44	.....
Nairn and Lorne, Tps.	.....	.....	103	.....	.....
Napanee, Tn.	2	3,000	1,500	2,000	.....
Nassagaweya, Tp.	4	2,500	2,800	50	.....
Neebing, Tp.	1	500	10,000	.....	.....
Neelon and Garson, Tps.	27	25,000	2,217	160	.....
Nelson, Tp.	10	13,000	6,700	.....	.....
Nepean, Tp.	250	200,000	10,662	1,852	.....
Neustadt, V.	3	10,000	623	.....	.....
Newboro,' V.	3	3,800	50	.....	.....
Newburgh, V.	.....	.....	708	.....	.....
Newbury, V.	2	2,200	160	.....	2,500
Newcastle, V.	2	20,000	1,000	100	.....
New Hamburg, V.	22	43,600	6,000	.....	25,000
New Liskeard, Tn.	12	15,400	3,932	3,310	90,764
New Toronto, V.	20	25,000	3,590	600	7,000
Newmarket, Tn.	30	60,000	5,000	1,000	42,000
Niagara, Tn.	12	64,600	4,259	99	61,000
Niagara, Tp.	6	10,000	4,000	.....	.....
Niagara Falls, C.	164	398,350	30,000	8,000	399,700
Nichol, Tp.	5	13,500	2,336	.....	.....
Nepigon, Tp.	2	2,275	91	.....	3,000
Nipissing, Tp.	7	5,500	193	.....	.....
Nissouri E., Tp.	8	10,240	2,017	218	2,200
Nissouri W., Tp.	18	12,000	5,156	.....	.....
Normanby, Tp.	.....	.....	15,000	.....	.....
North Bay, Tn.	203	292,940	40,293	26,398	335,422
Norwich, V.	6	15,000	800	284	14,300
Norwich N., Tp.	27	27,000	5,600	180	.....
Norwich S., Tp.	2	2,000	4,675	.....	.....
Norwood, V.	1	800	.....	.....	.....
Nottawasaga, Tp.	3	2,000	7,380	169	.....
Oakland, Tp.	.....	.....	700	.....	.....
Oakley, Tp.	1	400	.....	.....	.....
Oakville, Tn.	96	59,324	26,800	81,190	90,000
O'Connor, Tp.	6	1,000	1,826	200	.....
Oil Springs, V.	.....	.....	754	45	.....
Olden, Tp.	8	3,000	2,000	35	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Oliver, Tp.	12	13,500	1,837	243	8,000
Omemee, V.	.....	.....	420	.....	.....
Oneida, Tp.	6	16,500	1,693	24	.....
Onondaga, Tp.	6	4,600	6,200	11	.....
Ops, Tp.	6	6,500	6,573	146	.....
Orangeville, Tn.	5	26,700	1,000	610	54,000
Orford, Tp.	10	12,500	5,071	63	.....
Orillia, Tn.	.....	.....	6,236	11,878	526,000
Orillia, Tp.	7	7,000	5,392	132	.....
Oro, Tp.	8	12,000	2,193	.....	.....
Oshawa, Tn.	100	62,000	28,659	3,192	156,000
Osgoode, Tp.	.....	.....	10,663	.....	.....
Osnabruck, Tp.	36	11,000	6,070	125	.....
Oso, Tp.	6	6,000	2,000	.....	.....
Osprey, Tp.	40	24,500	3,132	185	8,370
Otonabee, Tp.	5	6,000	7,501	.....	.....
Ottawa, C.	545	3,991,380	467,795	247,206	4,065,658
Owen Sound, Tn.	97	103,000	8,661	8,362	722,231
Oxford on Rideau, Tp.	2	4,500	1,210	.....	.....
Oxford E., Tp.	4	9,200	6,367	183	.....
Oxford N., Tp.	6	10,000	2,500	100	1,947
Oxford W., Tp.	7	25,300	3,417	85	5,000
Paipoonge, Tp.	30	62,775	10,000	.....	3,000
Paisley, V.	.....	.....	500	315	6,500
Pakenham, Tp.	5	5,000	1,327	.....	.....
Palmerston, Tn.	5	10,000	1,500	1,000	67,000
Palmerston and North and South Canonto, Tps.	.....	.....	2,000	.....	.....
Papineau, Tp.	2	1,000	.....	.....	.....
Paris, Tn.	50	75,000	4,000	200	171,000
Parkhill, Tn.	.....	.....	.....	.....	30,000
Parry Sound, Tn.	12	477,000	3,000	.....	146,809
Peel, Tp.	2	3,000	2,151	284	.....
Pelee Island, Tp.	22	22,150	2,537	.....	6,500
Pelham	25	38,000	6,000	113	.....
Pembroke, Tn.	120	300,000	12,000	5,000	150,000
Pembroke, Tp.	6	8,000	219	.....	.....
Penetanguishene, Tn.	12	12,000	1,000	1,082	70,000
Percy, Tp.	5	10,000	3,000	100	.....
Perry, Tp.	2	2,000	1,096	.....	.....
Perth, Tn.	.....	.....	11,000	2,562	14,000
Peterborough, C.	310	488,540	46,982	17,659	572,389
Petewawa, Tp.	5	8,000	200	.....	.....
Petrolea, Tn.	4	15,000	17,700	5,902	190,430
Pickering, Tp.	18	40,000	13,513	1,430	.....
Picton, Tn.	10	125,000	7,000	300	65,000
Pilkington, Tp.	5	6,800	2,690	.....	.....
Pittsburgh, Tp.	1	800	2,592	24	.....
Plantagenet N., Tp.	18	25,000	2,000	300	.....
Plantagenet S., Tp.	34	48,600	8,100	85	.....
Plummer Additional, Tp.	6	4,000	1,459	.....	.....
Plympton, Tp.	4	4,500	5,809	.....	.....
Point Edward, V.	2	2,000	2,000	.....	.....
Port Arthur, C.	612	1,935,680	28,481	310,862	2,697,817
Port Carling, V.	3	1,500	961	59	.....
Port Colborne, V.	100	160,000	4,017	.....	48,000

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Port Dalhousie, V.	5	6,000	861	40	10,600
Port Dover, V.	7	6,000	3,522	350	.....
Port Elgin, V.	.....	.....	400	.....	42,000
Port Hope, Tn.	26	140,000	4,183	5,865	120,000
Port Perry, V.	4	34,000	1,000	15	30,000
Port Rowan, V.	1	1,200	.....	.....	.....
Port Stanley, V.	20	20,000	4,874	.....	42,630
Portland, Tp.	10	13,000	5,539	81	.....
Portsmouth, V.	1	1,600	800	.....	600
Powassan, Tn.	3	3,000	800	600	.....
Prescott, Tn.	6	20,000	1,200	100	95,000
Preston, Tn.	150	500,000	25,000	20,000	219,000
Prince, Tp.	.....	.....	1,253	.....	600
Proton, Tp.	.....	.....	6,246	.....	.....
Puslinch, Tp.	6	10,000	425	73	.....
Raglan, Tp.	1	500	38	.....	.....
Rainham, Tp.	11	12,500	900	.....	.....
Rainy River, Tn.	3	4,000	2,300	249	35,000
Raleigh, Tp.	25	1,575	2,250	.....	.....
Rama, Tp.	3	2,200	1,400	.....	.....
Ramsay, Tp.	3	4,000	5,357	140	.....
Rawdon, Tp.	4	2,000	.....	.....	.....
Rayside, Tp.	4	1,600	1,400	.....	.....
Reach, Tp.	18	22,000	5,000	42	.....
Renfrew, Tn.	50	200,000	28,778	2,074	324,845
Richmond, Tp.	2	3,000	1,800	.....	.....
Richmond West, V.	5	7,000	464	.....	5,765
Richmond Hill, V.	20	45,000	5,000	.....	9,000
Ridgetown, Tn.	5	12,000	5,000	.....	50,000
Rochester, Tp.	4	6,000	10,001	3,914	20,560
Rockland, Tn.	14	7,700	3,000	150	.....
Rodney, V.	1	6,000	500	.....	.....
Rolph, Buchanan, etc., Tps.	2	600	500	.....	.....
Romney, Tp.	10	20,000	2,000	.....	.....
Ross, Tp.	10	10,000	2,000	.....	.....
Roxborough, Tp.	20	15,000	2,721	.....	.....
Russell, Tp.	20	40,000	20,000	4,000	.....
Ryde, Tp.	.....	.....	287	.....	.....
St. Catharines, C.	405	760,000	266,585	78,765	736,000
St. Edmunds, Tp.	.....	.....	1,413	79	.....
St. Joseph, Tp.	9	9,600	2,482	100	.....
St, Mary's, Tn.	24	52,000	.....	.....	130,000
St. Thomas, C.	.....	.....	.....	.....	713,246
Salter, May and Harrow, Tps.	7	3,000	300	.....	.....
Saltfleet, Tp.	15	35,000	2,000	.....	.....
Sandfield, Tp.	.....	.....	608	.....	.....
Sandwich, Tn.	49	126,725	36,165	30,723	.....
Sandwich E., Tp.	26	8,000	30,000	.....	.....
Sandwich, S., Tp.	12	7,300	6,753	27	15,000
Sandwich W., Tp.	64	57,600	8,000	1,572	6,000
Sarawak, Tp.	2	2,400	858	53	.....
Sarnia, C.	70	157,300	19,931	4,163	225,000
Saugeen, Tp.	17	10,000	2,050	49	.....
Sault Ste. Marie, C.	190	385,036	108,446	40,632	.....
Scarborough, Tp.	50	150,000	4,000	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Schreiber, Tp.	19	41,000	556	156	.....
Scott, Tp.	2	4,000	3,204	650	.....
Scugog, Tp.	3	2,800	300	.....	.....
Seaforth, Tn.	1	6,000	.....	900	39,500
Sebastopol, Tp.	3	3,000	48	.....	.....
Seneca, Tp.	3	4,000	2,388	58	.....
Seymour, Tp.	.....	.....	8,607	.....	.....
Shallow Lake, V.	.....	.....	140	30	.....
Sheffield, Tp.	15	2,500	1,803	.....	.....
Shelburne, V.	.....	.....	1,200	700	32,500
Sherbrooke, Tp.	2	2,000	390	52	.....
Sherbrooke S., Tp.	3	3,000	200	.....	.....
Sherwood, Jones, etc., Tps.	3	900	.....	.....	.....
Shuniah, Tp.	15	7,000	10,000	.....	.....
Sidney, Tp.	8	8,000	5,649	477	.....
Simcoe, Tn.	31	60,000	11,600	181,000	90,000
Sioux-Lookout, Tn.	40	35,000	1,800	67	.....
Smith, Tp.	10	7,600	3,809	92	.....
Smith's Falls, Tn.	79	222,060	120,122	26,954	200,000
Snowdon, Tp.	2	800	950	.....	.....
Sombra, Tp.	4	4,000	1,500	300	.....
Somerville, Tp.	9	8,000	1,975	.....	.....
Sophiasburg, Tp.	4	8,000	1,721	.....	.....
Southampton, Tn.	4	1,400	797	1,401	43,617
South River, V.	1	900	269	.....	.....
Southwold, Tp.	6	8,500	15,845	.....	.....
Springer, Tp.	10	5,000	2,000	.....	.....
Springfield, V.	2	35,000	5,000	.....	.....
Stafford, Tp.	14	11,000	1,352	.....	.....
Stamford, Tp.	45	110,000	9,000	.....	10,000
Stanley, Tp.	.....	.....	3,000	135	.....
Stayner, Tn.	2	11,500	518	20	44,000
Steelton, Tn.	60	75,000	17,470	2,554	114,667
Stephen, Tp.	1	2,000	2,500	.....	.....
Stephenson, Tp.	8	8,000	1,237	.....	.....
Stirling, V.	3	4,700	351	.....	12,292
Stisted, Tp.	.....	.....	665	.....	.....
Storrington, Tp.	3	1,500	4,000	.....	.....
Stouffville, V.	1	3,500	650	.....	33,000
Stratford, C.	118	200,000	60,000	50,000	449,000
Strathroy, Tn.	11	13,900	4,555	550	66,000
Streetsville, V.	2	5,000	.....	20	33,500
Strong, Tp.	4	4,000	1,800	75	.....
Sturgeon Falls, Tn.	4	7,000	2,054	1,367	44,376
Sturgeon Point, V.	.....	.....	.....	161	.....
Sudbury, Tn.	271	723,385	40,000	50,000	289,267
Sullivan, Tp.	5	11,500	3,463	.....	.....
Sunnidale, Tp.	4	2,400	4,800	80	.....
Sutton, V.	12	16,000	800	60	.....
Sydenham, Tp.	13	9,500	.....	300	.....
Tara, V.	.....	.....	533	75	.....
Tarbutt and Tarbutt Addl. Tps.	4	2,500	1,050	.....	.....
Tarentorus, Tp.	12	25,000	5,790	.....	.....
Tavistock, V.	3	8,000	1,300	.....	23,000
Tay, Tp.	38	4,500	2,800	.....	.....
Tecumseth, Tp.	15	18,000	2,000	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Teeswater, V.	5	5,000	500	200	15,000
Tehkummah, Tp.	2	2,200	1,025	500	.....
Thamesville, V.	1	2,000	200	.....	18,500
Thedford, V.	3	25,500	950	.....	.....
Thessalon, Tn.	.....	.....	150	75	42,000
Thessalon, Tp.	2	2,000	827	33	.....
Thompson, Tp.	5	700	150	.....	.....
Thornbury, Tn.	1	2,500	.....	.....	30,000
Thorold, Tn.	20	40,000	29,425	14,682	150,000
Thorold, Tp.	20	100,000	2,000	.....	.....
Thurlow, Tp.	25	10,000	2,000	100	.....
Tilbury, Tn.	30	48,000	600	872	10,500
Tilbury E., Tp.	.....	.....	7,772	4,092	.....
Tilbury N., Tp.	12	12,000	3,000	.....	.....
Tilbury W., Tp.	17	20,000	750	68	23,100
Tillsonburg, Tn.	15	50,000	7,158	.....	65,000
Tiny, Tp.	10	13,600	3,500	.....	.....
Tiverton, V.	.....	.....	250	10	.....
Torbolton, Tp.	5	4,000	.....	.....	.....
Toronto, C.	9,884	27,038,624	3,406,186	2,594,999	17,643,128
Toronto Gore, Tp.	.....	.....	4,500	92	.....
Tossorontio, Tp.	6	5,500	3,000	.....	.....
Tottenham, V.	.....	8,000	.....	.....	8,000
Townsend, Tp.	10	20,000	3,035	50	.....
Trafalgar, Tp.	20	60,000	25,000	.....	.....
Trenton, Tn.	80	100,000	.....	.....	.....
Trout Creek, Tn.	.....	.....	700	.....	.....
Tuckersmith, Tp.	5	9,000	5,072	.....	39,600
Tudor and Cashel, Tps.	2	1,000	1,207	50	.....
Turnberry, Tp.	2	2,000	8,000	70	.....
Tweed, V.	3	8,000	1,500	200	.....
Tyendinaga, Tp.	9	4,650	2,870	.....	.....
Usborne, Tp.	6	8,500	4,124	76	.....
Uxbridge, Tn.	.....	.....	375	.....	.....
Uxbridge, Tp.	2	3,000	3,372	.....	.....
Van Horne, Tp.	9	2,500	650	.....	.....
Vankleek Hill, Tn.	4	4,000	900	100	.....
Vaughan, Tp.	.....	.....	17,011	.....	.....
Verulam, Tp.	.....	.....	2,955	.....	.....
Vespra, Tp.	25	30,000	5,250	114	7,000
Victoria Harbour, V.	5	2,500	2,406	52	.....
Vienna, V.	5	3,000	557	.....	.....
Wainfleet, Tp.	20	20,000	3,063	.....	.....
Walkerton, Tn.	6	15,000	2,500	100	45,000
Walkerville, Tn.	143	508,000	120,000	.....	88,000
Wallace, Tp.	7	3,000	3,500	250	.....
Wallaceburg, Tn.	25	57,400	14,400	.....	.....
Walpole, Tp.	18	25,800	8,729	233	.....
Walsingham N., Tp.	8	6,000	2,674	60	.....
Walsingham S., Tp.	7	9,300	5,000	.....	.....
Wardsville, V.	.....	.....	672	.....	.....
Warwick, Tp.	.....	.....	7,000	.....	.....
Waterdown, V.	4	6,000	1,346	25	.....
Waterford, V.	2	3,000	1,533	.....	5,600

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Waterloo, Tn.	69	236,000	25,000	14,650	227,483
Waterloo, Tp.	120	70,000	14,000	.....	18,000
Waters, Tp.	3	1,500	306	.....	.....
Watford, V.	8	22,300	.....	.....	.....
Watt, Tp.	7	5,300	500	.....	.....
Wawanosh E., Tp.	5	2,900	1,947	.....	.....
Wawanosh W., Tp.	.....	.....	3,197	113	.....
Webbwood, Tn.	.....	.....	862	664	.....
Welland, Tn.	287	611,157	163,464	18,401	277,000
Wellesley, Tp.	11	6,000	10,834	845	.....
Wellington, V.	14	18,100	1,510	5	.....
West Lorne, V.	6	4,157	990	157	1,000
Westmeath, Tp.	11	7,100	4,987	.....	.....
Westminster, Tp.	.....	.....	9,668	96	.....
Weston, V.	30	60,000	2,500	90,000	120,000
Westport, V.	1	2,000	.....	.....	.....
Whitby, Tn.	7	21,700	6,300	.....	114,000
Whitby, Tp.	.....	.....	2,000	100	.....
Whitby E., Tp.	10	10,000	10,000	.....	.....
Whitchurch, Tp.	7	8,000	4,286	.....	.....
Wiarton, Tn.	.....	.....	1,150	1,250	54,000
Widdifield, Tp.	16	7,800	836	.....	.....
Williams E., Tp.	1	12,000	4,619	.....	.....
Williams W., Tp.	.....	.....	2,751	.....	.....
Willamsburg, Tp.	5	900	8,293	.....	.....
Willoughby, Tp.	4	4,000	.....	.....	.....
Wilmot, Tp.	16	20,000	14,977	175	6,500
Winchester, V.	1	2,000	3,010	311	10,500
Winchester, Tp.	11	14,500	10,114	103	.....
Windham, Tp.	2	1,000	5,822	.....	.....
Windsor, C.	400	1,148,000	225,000	76,235	522,000
Wingham, Tn.	9	30,200	19,000	1,200	96,000
Wolfe Island, Tp.	.....	.....	2,000	.....	20,000
Wolford, Tp.	1	1,500	3,400	.....	.....
Wollaston, Tp.	2	1,000	650	.....	.....
Woodbridge, V.	2	4,000	933	.....	60
Woodhouse, Tp.	9	25,000	9,000	70	.....
Woodstock, C.	50	200,000	21,000	8,670	345,000
Woodville, V.	2	2,000	500	30	.....
Woolwich, Tp.	12	12,100	10 900	.....	.....
Worthington and Blue, Tps.	3	1,800	1,322	.....	.....
Wroxeter, V.	.....	.....	.....	.....	1,900
Wyoming, V.	2	2,700	200	.....	.....
Yarmouth, Tp.	23	30,000	18,859	7,000	.....
Yonge Front, Tp.	3	3,500	3,283	141	.....
Yonge and Escott Rear, Tps.	2	3,200	3,250	26	.....
York, Tp.	10	1,500	69,800	11,985	.....
Zorra E., Tp.	25	12,500	11,000	255	.....
Zorra W., Tp.	17	20,000	4,802	188	.....

MUNICIPAL STATISTICS.—*Concluded.*

SUMMARY.

Cities.	No. of new buildings erected during 1913.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Belleville	400	400,000	6,000	2,500	296,180
Berlin	271	651,871	200,000	35,000	936,450
Brantford	594	1,015,886	60,000	124,065	889,179
Chatham	151	308,310	46,289	11,126	278,458
Fort William	400	4,000,000	200,000	125,000	2,289,650
Guelph	172	357,335	34,475	12,000	1,065,899
Hamilton	2,019	5,110,000	774,145	229,169	4,211,156
Kingston	190	604 800	89,500	10,750	708,148
London	100	1,789,920	62,079	622,829	1,605 601
Niagara Falls	164	398,350	30,000	8,000	399,700
Ottawa	545	3,991,380	467,795	247,206	4,065,658
Peterborough	310	488,540	46,982	17,659	572,389
Port Arthur	612	1,935,680	28,481	310,862	2,697,817
St. Catharines	405	760,000	266,585	78,765	736,000
St. Thomas	.....	.....	.....	.....	713,246
Sarnia	70	157,300	19,931	4,163	225,000
Stratford	118	200,000	60,000	50,000	449,000
Toronto	9,884	27,038,624	3,406,186	2,594,999	17,643,128
Windsor	400	1,148,000	225,000	76,235	522,000
Woodstock	50	200,000	21,000	8,670	345,000
20 Cities	16,855	50,555,996	6,044,448	4,568,998	40,649,659
126 Towns	3,685	10,614,065	1,571,003	834,916	11,644,161
141 Villages	825	1,685,757	234,800	119,286	1,670,518
539 Townships	4,888	5,968,874	2,266,277	74,598	846,836
826 Grand Totals	26,253	68,824,692	10,116,528	5,597,798	54,811,174

PUBLIC UTILITIES CLASSIFIED.

The following table gives, in a classified form, the public utilities owned and operated by the municipalities, an additional column to contain this information having been appended to the municipal tables for the last six years. Again there is a satisfactory increase of these operations.

Municipalities.	(1) Water Works.	(2) Electric Lighting.	(3) Gas Works.	(4) Street Railways.	(5) Power Plant.	(6) Telephone System.	(7) Miscellaneous
	$	$	$	$	$	$	$
Acton, V.	.....	8,500	.....	.....	.....	.....	.....
Albemarle, Tp.	1,000	.....	.....	.....	.....	.....	.....
Alexandria, Tn.	35,750	11,750	.....	.....	.....	.....	.....
Alice and Fraser, Tps.	.....	.....	.....	.....	.....	450	.....
Alliston, Tn.	27,000	.....	.....	.....	.....	.....	.....
Almonte, Tn.	.....	40,000	.....	.....	.....	.....	.....
Amherstburg, Tn.	60,000	4,500	.....	.....	.....	.....	.....
Arnprior, Tn.	94,000	.....	.....	.....	.....	.....	.....
Aurora, Tn.	40,000	25,000	.....	.....	.....	.....	.....
Aylmer, Tn.	100,000	30,000	.....	.....	.....	.....	.....
Ayr, V.	.....	8,000	.....	.....	.....	.....	.....
Barrie, Tn.	124,854	90,452	.....	.....	.....	.....	.....
Bath, V.	.....	225	.....	.....	.....	.....	.....
Bayfield, V.	.....	.....	.....	.....	.....	1,385	.....
Beamsville, V.	27,000	.....	.....	.....	.....	.....	.....
Beaverton, V.	.....	10,000	.....	.....	.....	.....	.....
Bedford, Tp.	.....	.....	.....	.....	.....	1,000	.....
Beeton, V.	20,000	4,000	.....	.....	.....	.....	.....
Belleville, C.	206,111	90,069	.....	.....	.....	.....	.....
Berlin, C.	318,759	479,317	with (2)	138,374	.....	.....	.....
Blenheim, Tn.	.....	12,000	.....	.....	.....	.....	.....
Blyth, V.	with (1)	12,000	.....	.....	.....	32,000	.....
Bobcaygeon, V.	.....	25,000	.....	.....	.....	.....	.....
Bothwell, Tn.	4,500	6,000	.....	.....	.....	.....	.....
Bracebridge, Tn.	60,000	120,000	.....	.....	with (2)	.....	.....
Brampton, Tn.	125,000	80,000	.....	.....	.....	.....	.....
Brantford, C.	619,179	.....	.....	270,000	.....	.....	.....
Bridgeburg, V.	40,000	.....	.....	.....	.....	.....	.....
Brighton, V.	50,000	.....	.....	.....	.....	.....	.....
Brighton, Tp.	.....	.....	.....	.....	.....	16,000	.....
Brockville, Tn.	265,587	235,364	with (2)	.....	.....	.....	.....
Brooke, Tp.	.....	.....	.....	.....	.....	20,000	.....
Brussels, V.	.....	.....	.....	.....	.....	45,000	.....
Burk's Falls, V.	37,000	.....	.....	.....	.....	.....	.....
Burlington, V.	60,000	.....	.....	.....	.....	.....	.....
Caledonia, V.	.....	5,000	.....	.....	.....	.....	.....
Caradoc, Tp.	.....	.....	.....	.....	.....	16,000	.....
Casselman, V.	.....	.....	.....	.....	.....	.....	5,000
Chandos, Tp.	.....	.....	.....	.....	.....	3,000	.....
Chapleau, Tp.	48,000	.....	.....	.....	.....	.....	.....
Chatham, C.	238,458	40,000	.....	.....	.....	.....	.....
Chesley, Tn.	48,000	.....	.....	.....	.....	.....	.....
Chesterville, V.	.....	5,000	.....	.....	.....	.....	.....
Chinguacousy, Tp.	.....	.....	.....	.....	.....	30,000	.....

PUBLIC UTILITIES CLASSIFIED.—*Continued.*

Municipalities.	(1) Water Works.	(2) Electric Lighting.	(3) Gas Works.	(4) Street Railways	(5) Power Plant.	(6) Telephone System.	(7) Miscellaneous.
	$	$	$	$	$	$	$
Chippawa, V.	.....	1,050	.....	.....	.....	.....	.....
Clifford, V.	.....	.....	3,500	.....	.....	.....	.....
Clinton, Tn.	62,000	33,000	.....	.....	.....	.....	.....
Cobalt, Tn.	101,108	.....	.....	.....	.....	.....	.....
Cochrane, Tn.	90,000	.....	.....	.....	.....	.....	.....
Colchester, N., Tp.	.....	.....	.....	.....	.....	11,836	.....
Coldwater, V.	23,000	.....	.....	.....	.....	.....	.....
Collingwood, Tn.	74,373	51,425	.....	.....	.....	.....	.....
Collingwood, Tp.	7,000	.....	.....	.....	.....	.....	.....
Cornwall, Tn.	150,000	.....	.....	.....	.....	.....	.....
Creemore, V.	25,000	.....	.....	.....	.....	.....	.....
Culross, Tp.	.....	.....	.....	.....	.....	3,360	.....
Dawn, Tp.	.....	.....	.....	.....	.....	12,000	.....
Deseronto, Tn.	48,300	.....	19,000	.....	.....	.....	.....
Dover, Tp.	.....	.....	.....	.....	.....	3,500	.....
Dresden, Tn.	16,900	15,000	.....	.....	.....	.....	.....
Dumfries S., Tp.	.....	.....	.....	.....	.....	.....	3,000
Dundalk, V.	.....	8,000	.....	.....	.....	.....	.....
Dundas, Tn.	71,163	35,530	.....	.....	.....	.....	.....
Dunnville, Tn.	57,297	.....	.....	.....	.....	.....	.....
Dysart, Etc., Tps.	.....	500	.....	.....	.....	.....	.....
Easthope, N., Tp.	.....	.....	.....	.....	.....	24,000	.....
Elmira, V.	3,500	2,000	.....	.....	.....	.....	.....
Eramosa, Tp.	.....	6,000	.....	.....	.....	.....	.....
Essex, Tn.	35,000	.....	.....	.....	.....	.....	.....
Euphrasia, Tp.	.....	.....	.....	.....	.....	15,000	.....
Exeter, V.	28,234	.....	.....	.....	.....	.....	.....
Fenelon Falls, V.	.....	53,131	.....	.....	.....	.....	.....
Fergus, V.	38,000	16,000	.....	.....	.....	.....	.....
Fitzroy, Tp.	.....	60,000	.....	.....	.....	25,000	.....
Flos, Tp.	.....	.....	.....	.....	.....	25,000	.....
Forest, Tn.	.....	39,000	.....	.....	.....	.....	.....
Fort Erie, V.	60,000	.....	.....	4,000	.....	.....	.....
Fort Frances, Tn.	91,319	21,547	.....	.....	.....	.....	.....
Fort William, C.	959,500	197,150	.....	874,000	.....	259,000	.....
Galt, Tn.	276,355	136,000	.....	.....	.....	.....	.....
Gananoque, Tn.	150,000	.....	.....	.....	.....	.....	.....
Georgetown, V.	50,000	17,000	.....	.....	.....	.....	.....
Glencoe, V.	.....	11,000	.....	.....	.....	.....	.....
Gloucester, Tp.	5,000	.....	.....	.....	.....	.....	.....
Goderich, Tn.	125,956	with (1)	.....	.....	.....	.....	.....
Goderich, Tp.	.....	.....	.....	.....	.....	12,000	.....
Gore Bay, Tn.	.....	.....	.....	.....	.....	2,500	.....
Gosfield, N., Tp.	.....	.....	.....	.....	.....	18,850	.....
Gravenhurst, Tn.	30,000	90,000	.....	.....	.....	.....	.....
Grimsby, V.	.....	.....	.....	.....	.....	.....	.....
Guelph, C.	365,368	363,553	with (2)	336,978	.....	.....	.....
Hagersville, V.	.....	8,000	.....	.....	with (2)	.....	.....
Haileybury, Tn.	134,733	.....	.....	.....	.....	.....	.....
Hamilton, C.	3,651,156	560,000	.....	.....	.....	.....	.....
Hamilton, Tp.	.....	.....	.....	.....	.....	2,000	.....

PUBLIC UTILITIES CLASSIFIED.—*Continued.*

Municipalities.	(1) Water Works.	(2) Electric Lighting.	(3) Gas Works.	(4) Street Railways.	(5) Power Plant.	(6) Telephone System.	(7) Miscellaneous.
	$	$	$	$	$	$	$
Hanover, Tn.	35,350	.....	.....	.....	.....	.....	.....
Harriston, Tn.	35,000	11,000	.....	.....	.....	.....	.....
Hawkesbury, Tn.	135,000	.....	.....	.....	.....	.....	.....
Hay, Tp.	.....	.....	.....	.....	.....	20,000	.....
Hespeler, Tn.	.....	29,219	.....	.....	.....	.....	.....
Howick, Tp.	.....	.....	1,600	.....	.....	6,273	.....
Huntsville, Tn.	53,728	with (1)	.....	.....	.....	.....	.....
Huron, Tp.	.....	.....	.....	.....	.....	40,000	.....
Ingersoll, Tn.	125,000	100,000	.....	.....	with (2)	.....	.....
Iroquois, V.	40,000	with (1)	.....	.....	.....	.....	.....
Johnson, Tp.	.....	.....	.....	.....	.....	3,029	.....
Kearney, Tn.	700	.....	.....	.....	.....	.....	.....
Kenora, Tn.	212,872	43,159	.....	.....	507,637	17,453	.....
Kincardine, Tn.	50,085	22,336	.....	.....	.....	.....	.....
King, Tp.	.....	.....	.....	.....	.....	9,500	.....
Kingston, C.	318,870	186,857	202,421	.....	.....	.....	.....
Kingsville, Tn.	33,000	.....	.....	.....	.....	.....	.....
Laird, Tp.	.....	.....	.....	.....	.....	6,000	.....
Leamington, Tn.	27,500	.....	25,000	.....	.....	.....	.....
Leaside, Tn.	80,000	.....	.....	.....	.....	.....	.....
Lindsay, Tn.	128,631	.....	.....	.....	.....	.....	.....
Listowel, Tn.	46,000	20,470	.....	.....	.....	.....	.....
London, C.	1,135,528	470,073	.....	.....	.....	.....	.....
Lucan, V.	.....	5,000	.....	.....	.....	.....	.....
Lucknow, V.	10,000	.....	.....	.....	.....	.....	.....
			.....	.....	.....	.....	.....
McIrvine, Tp.	.....	1,000	.....	.....	.....	.....	.....
McKillop, Tp.	.....	.....	.....	.....	.....	18,000	.....
Macdonald, etc., Tps.	.....	.....	.....	.....	.....	2,400	.....
Madoc, V.	.....	5,000	.....	.....	.....	.....	.....
Maidstone, Tp.	.....	.....	.....	.....	.....	13,995	.....
Markdale, V.	.....	.....	.....	.....	.....	.....	.....
Markham, V.	15,000	with (1)	.....	.....	.....	.....	.....
Marmora, V.	.....	6,000	.....	.....	.....	.....	.....
Massey, Tn.	23,882	.....	.....	.....	.....	.....	.....
Meaford, Tn.	40,000	.....	.....	.....	.....	.....	.....
Medonte, Tp.	.....	.....	.....	.....	.....	20,000	.....
Merritton, V.	86,000	10,000	.....	.....	.....	.....	.....
Midland, Tn.	104,500	60,000	.....	.....	.....	.....	.....
Milton, W., Tn.	34,000	24,319	.....	.....	.....	.....	.....
Mimico, V.	.....	20,000	.....	.....	.....	.....	.....
Mitchell, Tn.	50,000	with (1)	.....	.....	.....	.....	.....
Moore, Tp.	.....	.....	.....	.....	.....	38,000	.....
Morris, Tp.	.....	.....	.....	.....	.....	31,558	.....
Morrisburg, V.	30,000	35,000	.....	.....	.....	.....	.....
Mount Forest, Tn.	50,000	with (1)	.....	.....	.....	.....	.....
Nepigon, Tp.	3,000	.....	.....	.....	.....	.....	.....
New Hamburg, V.	.....	25,000	.....	.....	.....	.....	.....
New Liskeard, Tn.	90,764	.....	.....	.....	.....	.....	.....
Newbury, V.	.....	2,500	.....	.....	.....	.....	.....
Newmarket, Tn.	42,000	with (1)	.....	.....	.....	.....	.....

PUBLIC UTILITIES CLASSIFIED.—*Continued.*

Municipalities.	(1) Water Works.	(2) Electric Lighting.	(3) Gas Works.	(4) Street Railways.	(5) Power Plant.	(6) Telephone System.	(7) Miscellaneous.
	$	$	$	$	$	$	$
New Toronto, V.	.....	7,000	.....	.....	.....	.....	.....
Niagara, Tn.	36,000	25,000	.....	.....	.....	.....	.....
Niagara Falls, C.	247,300	152,400	.....	.....	.....	.....	.....
Nissouri, E., Tp.	.....	2,200	.....	.....	.....	.....	.....
North Bay, Tn.	195,422	140,000	.....	.....	.....	.....	.....
Norwich, V.	.....	14,300	.....	.....	.....	.....	.....
Oakville, Tn.	72,000	18,000	.....	.....	.....	.....	.....
Oliver, Tp.	.....	.....	.....	.....	.....	8,000	.....
Orangeville, Tn.	54,000	.....	.....	.....	.....	.....	.....
Orillia, Tn.	120,000	406,000	.....	.....	.....	.....	.....
Oshawa, Tn.	156,000	.....	.....	.....	.....	.....	.....
Osprey, Tp.	.....	.....	.....	.....	.....	8,370	.....
Ottawa, C.	3,362,300	703,358	.....	.....	.....	.....	.....
Owen Sound, Tn.	359,326	206,763	156,142	.....	with (2)	.....	.....
Oxford, N., Tp.	.....	1,947	.....	.....	.....	.....	.....
Oxford, W., Tp.	.....	5,000	.....	.....	.....	.....	.....
Paipoonge, Tp	.....	.....	.....	.....	.....	3,000	.....
Paisely, V.	6,500	.....	.....	.....	.....	.....	.....
Palmerston, Tn.	50,000	17,000	.....	.....	.....	.....	.....
Paris, Tn.	92,000	79,000	.....	.....	.....	.....	.....
Parkhill, Tn.	30,000	.....	.....	.....	.....	.....	.....
Parry Sound, Tn.	65,165	81,644	.....	.....	.....	.....	.....
Pelee, Tp.	.....	.....	.....	.....	.....	6,500	.....
Pembroke, Tn.	150,000	.....	.....	.....	.....	.....	.....
Penetanguishene, Tn.	46,000	24,000	.....	.....	with (2)	.....	.....
Perth, Tn.	.....	14,000	.....	.....	.....	.....	.....
Peterborough, C.	572,389	.....	.....	.....	.....	.....	.....
Petrolea, Tn.	190,430	.....	.....	.....	.....	.....	.....
Picton, Tn.	65,000	with (1)	.....	.....	.....	.....	.....
Port Arthur, C.	1,015,941	550,640	.....	857,022	.....	274,214	.....
Port Colborne, V.	48,000	.....	.....	.....	.....	.....	.....
Port Dalhousie, V.	.....	10,600	.....	.....	.....	.....	.....
Port Elgin, V.	42,000	.....	.....	.....	.....	.....	.....
Port Hope, Tn.	120,000	.....	.....	.....	.....	.....	.....
Port Perry, V.	30,000	with (1)	.....	.....	.....	.....	.....
Port Stanley, V.	24,872	17,758	.....	.....	.....	.....	.....
Portsmouth, V.	.....	600	.....	.....	.....	.....	.....
Prescott, Tn.	75,000	20,000	.....	.....	.....	.....	.....
Preston, Tn.	128,000	91,000	.....	.....	.....	.....	.....
Prince, Tp.	.....	.....	.....	.....	.....	600	.....
Rainy River, Tn.	35,000	.....	.....	.....	.....	.....	.....
Renfrew, Tn.	145,324	.....	.....	.....	179,521	.....	.....
Richmond, W., V.	.....	5,765	.....	.....	.....	.....	.....
Richmond Hill, V.	.....	9,000	.....	.....	.....	.....	.....
Ridgetown, Tn.	38,000	12,000	.....	.....	.....	.....	.....
Rochester, Tp.	.....	.....	.....	.....	.....	20,560	.....
St. Catharines, C.	520,000	116,000	100,000	.....	.....	.....	.....
St. Mary's, Tn.	70,000	60,000	.....	.....	.....	.....	.....
St. Thomas, C.	329,964	113,926	194,356	75,000	.....	.....	.....
Sandwich, S., Tp.	.....	.....	.....	.....	.....	15,000	.....
Sandwich, W., Tp.	.....	.....	.....	.....	.....	6,000	.....
Sarnia, C.	225,000	.....	.....	.....	.....	.....	.....

PUBLIC UTILITIES CLASSIFIED.—*Continued.*

Municipalities.	(1) Water Works.	(2) Electric Lighting.	(3) Gas Works.	(4) Street Railways.	(5) Power Plant.	(6) Telephone System.	(7) Miscellaneous.
	$	$	$	$	$	$	$
Seaforth, Tn.	14,500	25,000					
Shelburne, V.	32,500						
Simcoe, Tn.	90,000						
Smith's Falls, Tn.	200,000						
Southampton, Tn.	43,617						
Stamford, Tp.	10,000						
Stayner, Tn.	35,000	9,000					
Steelton, Tn.	84,667	30,000					
Stirling, V.		12,292					
Stouffville, V.	28,000	5,000					
Stratford, C.	270,000	179,000					
Strathroy, Tn.	66,000	with (1)					
Streetsville, V.	6,500	27,000					
Sturgeon Falls, Tn.	44,376						
Sudbury, Tn.	214,267	75,000					
Tavistock, V.	23,000						
Teeswater, V.	15,000						
Thamesville, V.	12,000	6,500					
Thessalon, Tn.	42,000	with (1)					
Thornbury, Tn.	30,000	with (1)					
Thorold, Tn.	100,000	50,000					
Tilbury, Tn.	10,500	with (1)					
Tilbury, W., Tp.	500		600			22,000	
Tillsonburg, Tn.	35,000	30,000					
Toronto, C.	10,793,128	5,650,000		1,200,000			
Tottenham, V.		8,000					
Tuckersmith, Tp.						39,600	
Vespra, Tp.						7,000	
Walkerton, Tn.	45,000						
Walkerville, Tn.		58,000					30,000
Waterford, V.		5,600					
Waterloo, Tn.	110,449	69,085	47,949				
Waterloo, Tp.						18,000	
Welland, Tn.	212,000	65,000					
West Lorne, V.							1,000
Weston, V.	90,000	30,000					
Whitby, Tn.	114,000	with (1)					
Wiarton, Tn.	54,000						
Wilmot, Tp.		6,500					
Winchester, V.		10,500					
Windsor, C.	492,000	30,000					
Wingham, Tn.	51,000	45,000					
Wolfe Island, Tp.							20,000
Woodbridge, V.							60
Woodstock, C.	225,000	120,000					
Wroxeter, V.		1,900					
Totals	34,727,807	13,597,274	750,568	3,755,374	687,158	1,233,933	59,060
Grand Totals	54,811,174						

FREE EMPLOYMENT BUREAUS.

The six Free Employment offices operated by branches of this Bureau at Brantford, Hamilton, London, Ottawa, Berlin and Walkerville, have been carried on during the year with increased success. The details are tabulated below:

Applications for 1914.

Location.	Applications for work.		Help wanted.		Situations filled.	
	Male.	Female.	Male.	Female.	Male.	Female.
Berlin:—						
January	88	.....	11	.....	9	.....
February	97	.....	8	.....	8	.....
March	95	.....	48	.....	44	.....
April	48	.....	56	6	42	.....
May	60	.....	35	.....	34	.....
June	74	.....	28	6	24	.....
July	75	.....	26	.....	23	.....
August	121	.....	29	.....	24	.....
September	82	.....	30	.....	23	.....
October	20	.....	19	50	19	.....
November	41	.....	16	.....	16	.....
December	95	.....	10	.....	10	.....
Totals	896	.....	316	62	276	.....
Brantford:—						
January	34	3	17	3	17	3
February	15	6	14	5	6	5
March	30	2	21	6	19	2
April	61	2	54	3	46	2
May	62	15	65	14	54	12
June	131	17	115	16	112	16
July	144	13	103	11	98	11
August	159	14	82	15	82	7
September	147	18	73	15	73	9
October	133	20	52	21	52	17
November	135	7	69	16	69	6
December	145	9	86	16	86	8
Totals	1,196	126	751	141	714	98
Hamilton:—						
January	50	.....	10	.....	10	.....
February	30	.....	8	.....	8	.....
March	32	.....	18	.....	18	.....
April	39	2	17	2	17	2
May	65	.....	39	.....	39	.....
June	33	.....	25	.....	25	.....
July	35	.....	25	.....	25	.....
August	40	.....	8	.....	8	.....
September	28	.....	10	.....	10	.....
October	41	.....	7	.....	7	.....
November	34	.....	5	.....	5	.....
December	26	.....	7	.....	7	.....
Totals,	453	2	181	2	179	2

Applications for 1914.—Concluded.

Location	Applications for work.		Help wanted.		Situations filled.	
	Male.	Female.	Male.	Female.	Male.	Female.
London :—						
January	27	1	15	3	14	1
February	19	.....	8	.....	6	.....
March	11	1	10	1	7	1
April	9	.....	11	.....	8	.....
May	22	.....	13	.....	13	.....
June	31	.....	23	.....	18	.....
July	35	1	17	1	15	1
August	43	2	18	2	15	2
September	49	.....	16	.....	15	.....
October	36	4	22	3	22	3
November	42	2	17	3	17	2
December	20	1	3	1	3	1
Totals	344	12	173	14	153	11
Ottawa :—						
January	84	.....	8	.....	8	.....
February	50	2	8	3	8	2
March	62	3	24	5	24	3
April	92	3	19	5	19	3
May	61	9	21	4	21	4
June	125	4	101	8	101	4
July	81	11	8	11	8	9
August	35	10	13	6	13	6
September	65	10	14	9	14	7
October	69	10	19	5	19	5
November	82	6	9	1	9	1
December	39	6	4	2	4	2
Totals	845	74	248	59	248	46
Walkerville ;—						
January	51	25	4	20	4	20
February	37	3	8	2	8	2
March	30	.....	9	.....	9	.....
April	60	.....	16	.....	15	.....
May	35	.....	14	.....	13	.....
June	72	.....	8	.....	8	.....
July	56	.....	9	.....	9	.....
August	30	.....	5	.....	5	.....
September	53	.....	21	.....	19	.....
October	82	.....	42	.....	42	.....
November	70	2	20	2	20	2
December	54	2	28	2	28	2
Totals	630	32	184	26	180	26
Grand Totals	4,364	246	1,853	304	1,750	183

Applications by Trades for 1914.

Trade or calling.	Applications for work.		Help wanted.		Situations filled.	
	Male.	Female.	Male.	Female.	Male.	Female.
Agent	20		6		6	
Auto Assemblers	17		12		10	
Auto Finishers	1					
Auto Trimmers	3					
Auto Labourers	5					
Auto Mechanics	9					
Auto Top Makers	2		2		2	
Bakers	20		8		7	
Band Sawyer	5		1		1	
Barbers	1		1		1	
Bartenders	1					
Bell Phone Hands	1	1	1	1	1	1
Blacksmiths	88		39		39	
Blacksmiths' Helpers	2		1		1	
Boilermakers	7		3		3	
Bookkeepers	2					
Bow Man	1		1		1	
Brass Moulders	1		1		1	
Bricklayers	67		18		15	
Brush Makers	2					
Butchers	2		1		1	
Cabinet Makers	34		1			
Candy Makers	1					
Canvassers	6		5		5	
Caretakers	1		1		1	
Carpenters	224		119		117	
Concrete Men	1		1		1	
Cigarmakers	3					
Clerks	22	10	10	5	8	5
Coachmen	1					
Cook	4	1		1		1
Cooper	10		6		6	
Core Makers	1					
Die Setter	1		1		1	
Domestics		119		164		96
Day Woman		27		24		23
Draughtsman	1					
Drill Hands	39		17		16	
Electricians	1					
Elevator Man	1					
Engineers	3		1			
Factory Hands		52		29		29
Farm Hands	433	2	370	2	341	2
Firemen	4		2		2	
Finishers	5		4		2	
Gardeners	1		1		1	
Gas Fitters	6		1		1	
Iron Workers	36		18		15	
Labourers	2,778		987		967	
Lathe Hands	4		2		2	
Machine Hands	3		1			
Machine Operators		16		69		13
Machinists	115		19		17	
Masons' Helpers	5					
Millwrights	1					
Motor Truckmen	6					
Moulders	53		22		20	
Motor Man	2					
Night Watchman	5		4		4	
Painters	94		62		60	
Carriage Painters	20		11		9	

Applications by Trades for 1914—*Concluded.*

Trade or calling.	Applications for work.		Help wanted.		Situations filled.	
	Male.	Female.	Male.	Female.	Male.	Female.
Paperhangers	7		6		6	
Pipe Fitters	1					
Plasterers	4		9		4	
Polishers	2					
Plumbers	11		2		2	
Porters	28		5		5	
Printers	2					
Punch Press Men	2					
Rubber Workers	6		11		6	
Salesmen			10			
Sewing Operators				6		
Shoemaker (Factory)	1	4	1	3		3
Steam Fitters	1		1		1	
Stove Mounters	3					
Stenographers		4		2		2
Tester (Auto)	3					
Tool Makers	7		2		2	
Tailors	1					
Teamsters	68		26		20	
Tinsmiths	5		2		2	
Trim Sawyer			1			
Trimmers	1					
Turret Lathe Hand	1		1		1	
Upholsterers	5		5		5	
Varnish Rubbers	3					
Vise Hands	16		8		7	
Waitresses		10		8		8
Watchmen	2					
Washer for Creamery	1		1		1	
Wood Workers	1					
Total	4,364	246	1,853	304	1,750	183

SUGGESTIONS FROM LABOUR ORGANIZATIONS

Journeymen Barbers' International Union, No. 304, Berlin. We would suggest that the working hours on Saturday be cut down. Sixteen hours on Saturday is by far too long. A by-law should be passed by the Legislature to that effect.

International Brotherhood of Maintenance of Ways Employees, No. 502, Blenheim. In the interest of "Safety First" and for the security of the public at large, we would strongly recommend to the Minister of Railways that railway companies be compelled to place a man to each mile of track a foreman is responsible for. This is a Dominion matter. Secretary, Labour Bureau.

United Brotherhood of Carpenters and Joiners, No. 198, Brantford. We would suggest that the Department should recognize the necessity of consulting the carpenters before setting up a schedule for wages on any public building, and that wage should be the standard or average wage and not the lowest rate of wages paid to handy men.

United Brotherhood of Carpenters and Joiners, No. 2603, Burlington. We are of the opinion that all public work that is being done by the Government should have the fair wage clause inserted.

Western Federation of Miners, No. 146, Cobalt. Suggestions that in our opinion will tend to benefit the workers in the mining, milling and smelting industry, and that are of sufficient importance to claim the attention of the Provincial Legislature. 1st. An eight-hour work day for all workers in the mining, milling and smelting industry. 2nd. The enforcement of the health and sanitary laws already on the statutes, believing that there is nothing more important to the health and happiness of the workers in our industry than the enforcement of these laws. 3rd. The elimination of private gunmen employed by the mining companies during time of strikes when the workers are forced to use this method to better their conditions. 4th. Enforce the mining companies to install suitable apparatus to lay all dust caused by blasting, drilling, or otherwise; also suitable ventilation in all underground workings, especially where hydraulic air is used. 5th. That legislation be provided for to investigate how far diseases of the mining industry have made inroads on the workers concerned, such as miners' phthisis, tuberculosis, etc., that statistics be compiled, and the necessary steps be taken for the elimination of such diseases, believing that one ounce of prevention in this case is worth more than one pound of cure.

Bricklayers', Masons' and Plasterers' International Union, No. 25, Fort William. We would suggest that all trades be paid once a week and in cash; also all trades have the Saturday half-holiday.

International Dredge Workers' Protective Association, No. 9, Fort William. We are strongly in favour of having the Workmen's Compensation Act put in force as soon as possible; also an eight-hour day on all public works in Canada. (The Workmen's Compensation Act went into force Jan. 1, 1915. Sec., Labour Bureau.)

International Association of Machinists, No. 309, Fort William. We submit that all payments should be made fortnightly.

International Brotherhood of Maintenance of Ways Employees, No. 277, Fort William. We desire the enforcement of the sanitary laws covering boarding cars; also a law compelling all foremen responsible for upkeep of tracks to have at least three years' experience before they assume the responsibility, so as to protect the travelling public.

United Association of Plumbers and Steam Fitters, No. 257, Fort William. We strongly urge the passing of a provincial law governing the installation of plumbing; also calling for the examination of all plumbers working at the trade, certificates of proficiency being issued to those who pass the examination successfully; also the passing of a law making an eight-hour day compulsory in all trades and occupations, with a half-holiday on Saturday.

Bricklayers and Masons, No. 1, Hamilton. Scaffold inspectors sadly needed. Eight-hour universal work day, four hours Saturday. Weekly pay. Union rate of wages and union conditions on all works. Inspectors over masonry or brickwork to be practical masons or bricklayers. Places of convenience for both sanitary and decency whilst works are under construction. Tool houses for protection of workmen's tools. Practical inspectors that will inspect and enforce better construction. When any controversy arises, the stoppage of aliens or others from taking places of parties concerned, the matter to be settled by the parties directly in connection with each other by their joint executives. The inadvisability of the introduction of concrete taking the place of stone and brick. The enforcement of apprentices taking geometrical course, so as to have a thorough knowledge and understanding of plans and blue prints, a better class of materials to be used in construction of all structures, large or small.

Brotherhood of Painters, Paperhangers and Decorators, No. 205, Hamilton. We would recommend greater restrictions in regard to immigration, the appointment of a scaffold inspector, a law compelling the removal of all old paper and calsomine before new paper or calsomine is put on, greater care taken in regards to people moving out of houses when the family is still suffering from scarlet fever or other contagious diseases.

United Association of Plumbers and Steam Fitters, No. 67, Hamilton. We would suggest that Provincial plumbing by-laws be enacted, and that all municipalities of over 10,000 be compelled to appoint inspectors to enforce the same.

Brotherhood of Railway Trainmen, No. 226, Hamilton. It is the general feeling that legislation *re* the hours of labor should be adjusted the same as in effect in the United States (sixteen-hour law). That the number of men to be placed upon a train for the safe and sane handling of it should be standardized. That the twice a month pay would be an advantage for the men in general and would be greatly appreciated.

Brotherhood of Railway Carmen, No. 236, Kenora. We desire a compulsory eight-hour day, fortnightly payments, sanitary conveniences for eating, etc., arrangements made to enable relay men to get meals after working not more than five consecutive hours. Under the "Safety First" we suggest grab irons and toe holds be placed in bunkers or wells of refrigerators, a large number of cars being without any of the aforementioned, which is a sourse of considerable danger when attending heaters.

Brewery Workers' Union, No. 381, London. We are in favour of the present license laws and reasonable enforcement of the same.

International Brotherhood of Electrical Workers, No. 120, London. We would suggest that legislation *re* line construction for the safety of men would greatly help; also the use of first-aid kits in each gang and the use of pulmotors, and where men are operating switchboards and are compelled to work shifts alone, if these men had helpers it would be a great help in time of danger.

Order of Railway Telegraphers, No. 1, London. There should be legislation passed prohibiting any railway company working their agents and telegraphers more than eight consecutive hours per day. Such legislation would be in the interest of the travelling public.

Bricklayers', Masons' and Plasterers' International Union, No. 27, Niagara Falls. That a clause be inserted in all contracts stating that union wages be paid and hours of labor not to exceed eight hours per day.

United Brotherhood of Carpenters and Joiners, No. 2625, North Bay. We are of opinion that in all public work contracts a fair wage clause should be inserted, and that a municipal inspector be appointed to inspect all buildings in course of construction to prevent bad and cheap methods of doing sanitary and other important work which is now done by all kinds of speculators passing off work which is dangerous to health, as well as unsafe in construction, from which the public should be protected.

Amalgamated Society of Engineers, No. 885, Ottawa. That the Legislature pass a Bill to confine all Government contractors to an eight-hour day and a living wage, and to determine the wage paid in the district where work is placed, is the earnest wish of all our members.

International Union of Steam and Operating Engineeers, No. 473, Ottawa. The engineers' license laws are not enforced enough in this city and vicinity for public safety, and the above union strongly approve of an engineer inspector for Ottawa and vicinity to help enforce the license laws.

Brotherhood of Locomotive Firemen and Enginemen, No. 172, Ottawa. We would like wages to be paid weekly or fortnightly.

International Association of Machinists, No. 825, Ottawa. The members of our organization would like to see a shorter period between pay days inaugurated.

Canadian Association of Stationary engineers, No. 25, Owen Sound. The only thing that will improve our condition is for engineers to get graded certificates, viz., 1st, 2nd and 3rd class.

Western Federation of Miners, No. 145, Porcupine. We suggest the enforcement of the eight-hour day, the sanitary laws and independent medical and hospital service. The question of miner's consumption will become a serious one in the near future. In connection with this the mining law in South Africa forbids the driving of raises in any of the mines.

Canadian Association of Stationary Engineers, No. 29, Port Arthur. We hope to see graded certificates before long.

International Brotherhood of Painters, Paperhangers and Decorators, No. 407, St. Catharines. All government work should be done by day labour instead of contract, and have a fair wage clause same as Dominion Government for all Provincial work.

Boilermakers, Iron Ship Builders and Helpers of Canada, No. 3, Stratford. We are of the opinion that there should be a fortnightly pay.

Bricklayers' and Masons' Union, No. 24, Stratford. A more rigid enforcement of building by-laws, particularly of public buildings, hotels, etc., while in course of construction, would possibly ensure greater safety to the public.

Amalgamated Society of Engineers, No. 597, Stratford. We want fortnightly payments.

International Brotherhood of Maintenance of Ways Employees, No. 40, Sudbury. We suggest that instead of section gangs being reduced to foreman and one man on a six-mile section consisting of curves and rock cuts, the number of men employed should average one man per mile of track during the winter months.

Brotherhood of Railway Carmen, No. 258, Toronto. Would suggest fortnightly pay, better sanitary arrangements, shelter from the weather, also places to dry and hang clothes, lunch or dining-rooms, with accommodation for washing before leaving for home.

Egg Inspectors' Union of Toronto, No. 14,578, Toronto. The sanitary conditions and ventilation of the rooms in which we work would be the better for inspection, and such inspection should be carried out by a man who understands the conditions of the trade. Any appointments made by the Government dealing with egg inspection should be made from among experienced inspectors with practical knowledge of the subject and not given to men with no practical experience.

Hoisting and Portable Engineers, No. 356, Toronto. We suggest that a license law governing hoisting and portable engineers would be a great benefit to the employer as well as the employee, as it would give a better class of workman.

Plasterers' Laborers' Association, No. 1, Toronto. We submit that all payments should be made weekly.

United Association of Plumbers and Steam Fitters, No. 46, Toronto. We are strongly of the opinion, based on experience, that a provincial statute regulating plumbing and drainage would be beneficial to the trade and even more so to the public.

International Tailors' Industrial Union, No. 132, Toronto. We desire abolition of home work; abolition of contract and piece system; equal work and equal pay to male and female; substitution of weekly system and payment of wages direct by merchant or employer; establishing of work shops on premises of employer.

Commercial Telegraphers' Union of America, Div. No. 1, Toronto. We desire semi-monthly pay.

Waiters' Union of America, No. 300, Toronto. We suggest that the waiters receive one day off in seven; better sanitary conditions; and that the employees' dining-halls and dressing-rooms be inspected at least four times a year.

International Association of Machinists, No. 834, Trenton. We submit that all payments should be fortnightly, and improved shop conditions.

Order of Railway Conductors, No. 494, Windsor. As "Safety First" is the battle-cry of all the railroads, we believe some attention should be given to locomotives and cabooses the employees are compelled to ride in, some of which are absolutely unsafe.

International Brotherhood of Locomotive Engineers, No. 390, Windsor. In yard switching service we are compelled to work twelve hours per day and twelve hours on the night shift. We would like to have three shifts of eight hours each instead of two at twelve hours, as yard switching has to be done twenty-four hours a day.

Plasterers' International Association, No. 345, Windsor. We would suggest a weekly pay day; the employment of union labor on all Government contracts and a Government building inspector for all public buildings.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.

Name of Organization.	Name of President	President's Address	Name of Secretary	Secretary's Address	Nights of Meeting
Allandale:					
Order of Railway Conductors, No. 355	D. Scott	Essa Street, Allandale.	J. McMillin	96 Cumberland Street, Allandale	3rd Sunday in month.
Brotherhood of Locomotive Firemen and Enginemen, No. 442	E. Cheesman	Bradford St., Barrie	F. Harris	11 Granville Street, Allandale	2nd and 4th Sundays in month.
International Brotherhood of Maintenance of Ways Employees, No. 200	E. Stephenson	Allandale	F. Foster	Craigvale	3rd Thursday in month.
Brotherhood of Railway Trainmen, No. 377	C. McNiven	Ross Street	G. Payne	Allandale	2nd and 4th Sundays in month.
Amherstburg:					
International Rock Drillers' Association, No. 20	R. Kett	Amherstburg	L. Parker	Amherstburg	1st Sunday in month.
International Brotherhood of Steam Shovel and Dredgemen, No. 20	S. White	Amherstburg	J. Ryan	Box 196, Amherstburg.	Call of President.
Beaverton:					
International Brotherhood of Maintenance of Ways Employees, No. 262	J. Thompson	Pefferlaw	A. Boynton	Washago P.O.	Call of President.
Belleville:					
Journeymen Barbers' International Union, No. 723	A. Watt	322 Front Street	J. Boyle	253 Front Street	4th Tuesday in month.
Bricklayers', Masons' and Plasterers' Int. Union, No. 30	W. Johnson	32 Earl Street	A. Ellis	30 Harriott Street	1st and 3rd Mondays in month.
Brotherhood of Locomotive Engineers, No. 189	W. Rogers	312 Foster Avenue	H. Lavois	279 Foster Avenue	3rd Sunday in month.
International Brotherhood of Maintenance of Ways Employees, No. 83	J. Exley	Box 346, Shannonville.	H. Lindstrom	35 Grier Street	Last Sunday in month.
Plumbers, Gas and Steam Fitters and Helpers of North America, No. 220	John Holly	Everett Street	W. Cronk	224 Front Street	
Berlin:					
Journeymen Barbers' International Union, No. 304	O. Boll	61 Queen Street	H. Hoffman	53 King Street	3rd Monday in month.

Boot and Shoe Workers' Union, No. 206	L. Albrecht	102 King Street	H. Oberer	130 Louisa Street	2nd and 4th Fridays in month.
International Union of Brewery Workers, No. 170	W. Massel	Waterloo	A. Elhantz	21 Elgin Street, Berlin.	2nd and 4th Tuesdays in month.
Bricklayers', Masons' and Plasterers' International Union, No. 12	J. Hehel	172 Benton Street	J. Davenport	13 Pine Street	1st and 3rd Fridays in month.
United Brotherhood of Carpenters and Joiners, No. 553	D. Mather	66 Sharon Street	H. Schneider	87 Samuel Street	1st and 3rd Fridays in month.
Cigarmakers' International Union, No. 422	J. Schnitzler	Waterloo	J. Schrank	109 Peter St., Berlin	2nd Tuesday in month.
International Brotherhood of Electrical Workers, No. 535	W. Mitchell	247 Mill Street	G. Steiss	113 Louisa Street	1st and 3rd Fridays in month.
Canadian Association of Stationary Engineers, No. 9	R. Simpson	Dominion Sugar Co	C. Emerich	186 Victoria Street	2nd and 4th Fridays in month.
Federal Labour Union, No. 17	F. Ackerknecht	33 King Street West	A. Schnarr	139 Church Street	1st and 3rd Thursdays in month.
Hodcarriers and Building Laborers' Union, No. 160	H. Potan	Waterloo Street	G. Hoffman	58 Homewood Avenue.	1st and 3rd Wednesdays in month.
Federated Association of Letter Carriers, No. 20	D. Hamacker	Martin Street	M. Kuenemann	180 Wellington Street	3rd Friday in month.
American Federation of Musicians, No. 226	G. Albrecht	151 Wellington Street	P. Kroetsch	106 Water Street	1st Sunday in month.
Upholsterers' International Union, No. 42	J. Wotherspoon	Weber Street	H. Behrend	100 Water Street	2nd and 4th Wednesdays in month.
Blenheim:					
International Brotherhood of Maintenance of Ways Employees, No. 502	A. Mansel	Blenheim	S. Tilley	48 Park Avenue W.	Call of President.
Brantford:					
Journeymen Barbers' International Union, No. 298	J. Rice	5 George Street	T. Linscott	248 Colborne Street	Last Monday in month.
Bartenders' International League, No. 182	H. O'Connell	106 Market Street	J. Knight	Kerby House	Last Sunday in month.
Bricklayers', Masons' and Plasterers' International Union, No. 9	A. Francis	180 Sheridan Street	A. Fischer	Grand View P.O.	Alternate Thursdays in month.
United Brotherhood of Carpenters and Joiners, No. 498	A. Brown	Grand View P.O.	C. Packham	305 Sheridan Street	2nd and 4th Tuesdays in month.
International Brotherhood of Electrical Workers, No. 443	F. Stewart	277 Darling Street	N. Linington	10 West Street	Alternate Mondays in month.
Canadian Association of Stationary Engineers, No. 4	T. Pilgrim	124 Erie Avenue	J. Ogle	73 Richmond Street	1st and 3rd Mondays in month.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President	President's Address	Name of Secretary	Secretary's Address	Nights of Meeting
Brantford.—*Continued.*					
International Moulders' Union, No. 29	T. Sleeth	Eagle Place	E. Dunn	46 King Street	1st and 3rd Fridays in month.
Operative Plasters' International Union, No. 164	H. Arthur	325 St. Paul's Avenue	H. Perrin	7 Holmes Street	Alternate Thursdays in month.
Journeymen Stonecutters' Association of N. America	J. Anderson	General Delivery	W. Fairley	33 Alonzo Street	2nd and 4th Tuesdays in month.
International Typographical Union, No. 378	G. Moore	10 Jarvis Street	Ira Scruton	24 Wells Avenue	4th Wednesday in month.
Bridgeburg:					
Brotherhood of Railway Carmen, No. 542			A. Merryweather.	Bridgeburg	
United Brotherhood Carpenters and Joiners, No. 1850	J. Malcolm	Amigari	O. Sherk	Bridgeburg	1st and 3rd Mondays in month.
Brotherhood of Locomotive Engineers, No. 679	R. Walsh	411 Dearborne Street, Buffalo, N.Y.	M. Harvey	Bridgeburg	1st Wednesday and 2nd Tuesday in month.
Brotherhood of Railway Trainmen, No. 713	G. Hanes	Dufferin Street	G. Smith	Central Avenue	1st and 3rd Tuesdays in month
Brockville:					
Order of Railway Conductors, No. 366	R. Dickson	Brockville	G. Graham	121 Pearl Street W	1st and 3rd Sundays in month.
Brotherhood of Locomotive Engineers, No. 118	E. Mortimer	52 Charles Street	R. Wardrop	39 Daniel Street	3rd Tuesday in month.
Journeymen Tailors' International Union, No. 262	E. Enright	Church Street	C. Hamilton	24 John Street	1st Monday in month.
Brotherhood of Railway Trainmen, No. 208	H. Walter	55 Pearl Street	W. Barkley	43 Pearl Street	1st and 3rd Sundays in month.
Burlington:					
United Brotherhood Carpenters and Joiners, No. 2603	G. Pearse	Clark Avenue	S. Cooper	Burlington P.O.	2nd and 4th Thursdays in month.
Carleton Place:					
International Brotherhood Blacksmiths and Helpers, No. 424	S. Hale	Carleton Place	R. Curtis	Box 224, Carleton Place	4th Saturday in month.
Brotherhood of Railway Carmen, No. 229	T. Carson	Carleton Place	R. New	Box 341, Carleton Place	4th Tuesday in month.

International Association of Machinists, No. 211	E. Merkle	Carleton Place	J. McFadden	Box 326, Carleton Place	1st and 3rd Thursdays in month.
International Brotherhood Maintenance of Ways Employees, No. 222	A. Robertson	Carleton Place	I. Steele	Box 313, Carleton Place	Last Saturday in month
International Moulders' Union, No. 362	G. Murray	Carleton Place	J. Carson	Box 292, Carleton Place	3rd Thursday in month.
Metal Polishers, Buffers, Platers and Brass Workers' International Union, No. 96	M. Saunders	Box 301, Carleton Place	O. Fleming	Carleton Place	1st Thursday in month.
Stove Mounters' International Union, No. 78	C. Morphy	Charles Street	P. Thompson	Charles Street	2nd and 4th Thursdays in month.
Chapleau:					
Brotherhood of Railway Carmen, No. 378	W. Westerman	Chapleau	A. Bennett	Box 311, Chapleau	4th Monday in month.
Brotherhood of Locomotive Engineers, No. 319	P. Downey	Chapleau	J. Stanley	Chapleau	Every Monday in month
Brotherhood of Locomotive Firemen and Enginemen, No. 321	C. Card	Chapleau	V. Perpete	Chapleau	Every Wednesday in month.
International Association of Machinists, No. 535	T. Ferguson	Box 57, Chapleau	R. Stewart	Box 57, Chapleau	2nd and 4th Wednesdays in month.
Chatham:					
United Brotherhood Carpenters and Joiners, No. 1583	J. McLean	301 St. Clair Street	J. Trousdell	256 St. Clair Street	Every Tuesday in month.
United Garment Workers of America, No. 44	Miss E. Ruddling	81 Patterson Avenue	Miss B. Garner	66 Wellington Street	Last Tuesday in month.
American Federation of Musicians, No. 629	E. Bradden	123 William Street N.	F. Phelps	41 Grey Street	Call of President.
International Typographical Union, No. 421	G. Morrell	St. Clair Street	A. Riddell	Box 382, Chatham	1st Monday in month.
Cobalt:					
United Brotherhood of Carpenters and Joiners, No. 894	S. Clark	Haileybury	B. Marker	North Cobalt	1st and 3rd Wednesdays in month.
International Steam and Operating Engineers, No. 531	S. Carscallen	160 Erie Street			Every Wednesday and last Sunday in month.
Western Federation of Miners, No. 146	T. Bradley	21 Silver Street	J. Gorman	Box 446, Cobalt	Every Sunday in month
Order of Railway Telegraphers, No. 99	J. Flagler	Cochrane	M. Doherty	Uno Park	Call of Secretary.
Collingwood:					
Journeymen Barbers' International Union, No. 528	— Gardiner	Globe Hotel	A. Moffat	Collingwood	

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President	President's Address	Name of Secretary	Secretary's Address	Nights of Meeting
Collingwood.—*Continued.*					
Bricklayers' Masons' and Plasterers' International Union, No. 19	J. Gilham	Box 777, Collingwood	W. Court	Box 797, Collingwood	3rd Wednesday in month.
Amalgamated Society of Engineers, No. 805	N. Robinson	St. Marie Street	T. Kelly	11 Beach Terrace	2nd Monday in month.
National Association Marine Engineers, No. 3	W. Rennie	St. Paul Street	R. McQuade	Pine Street	Every Tuesday during winter months.
International Association of Machinists, No. 627	T. Howard	Collingwood	L. Hawkes	Box 977, Collingwood	2nd and 4th Wednesdays in month
Cordova:					
Western Federation of Miners, No. 147	D. McCurdy, Sr.	Cordova Mines	J. Young	Cordova Mines	1st and 2nd Sundays and last Monday in month.
Dundas:					
Moulders' International Union, No. 269	L. McManamy	Dundas P.O.	M. Dunn	Box 117, Dundas	2nd and 4th Mondays in month.
Elk Lake:					
Western Federation of Miners, No. 140	W. Scott	Elk Lake	E. Burton	Box 348, Elk Lake	Every Sunday in month.
Englehart:					
International Brotherhood Maintenance of Ways Employees, No. 3	S. Rose	Englehart	D. Little	Box 451, Englehart	4th Sunday in month.
Fort William:					
Journeymen Barbers' International Union, No. 549	R. Yorke	Empire Hotel	W. Ginn	108 North Hay Street.	4th Monday in month.
Bartenders' International League, No. 761	R. Brebner	Simpson Street	R. Carson	215 Bethune Street	2nd and 4th Sundays in month.
Int. Brotherhood of Boilermakers, Iron Ship Builders and Helpers, No. 505	I. Hunter	213 Frederica Street	F. Stafford	420 Mary Street	1st and 3rd Fridays in month.
Bricklayers', Masons' and Plasterers' International Union, No. 25	S. Hartley	44 Shuniah Road, Port Arthur	F. Robinson	112 Windermere Ave., Port Arthur	2nd and 4th Thursdays in month.

International Association of Bridge and Structural Iron Workers, No. 53	Angus McLeod	Fort William	F. Souch	382 East Mary Street	1st and 3rd Fridays in month.
United Brotherhood Carpenters and Joiners, No. 2610.	H. Blackburn	133 N. Harold Street	G. Dutton	701 Catharine Street	1st and 3rd Mondays in month.
Order of Railway Conductors, No. 286	A. Blennerhassel	1201 Victoria Avenue	A. Marcotte	439 Wiley Street	2nd and 4th Sundays in month.
International Dredge Workers' Protective Association, No. 9	J. Quackenbush	216 Leith Street	B. Kyle	Box 70, Fort William	4th Saturday in month.
International Union of Steam Shovel and Dredgemen No. 9	W. Fielas	Box 70, Fort William.	L. Filloch	Box 70, Fort William.	3rd Saturday in month.
International Union of Steam Shovel and Dredgemen No. 39	J. O'Neill	Cloquet, Minn.	D. Kentner	Box 236, Fort William.	3rd Saturday in month.
International Steam and Operating Engineers, No. 298	W. Downing	28 Ontario Street, Port Arthur	W. Gunby	110 S. Harold St., Fort William	1st and 3rd Wednesdays in month.
Brotherhood of Locomotive Firemen and Enginemen, No. 225	A. Kennedy	624 Wiley Street	P. Dargaval	624 Wiley Street	2nd and 4th Thursdays in month.
Journeymen Horseshoers'- International Union, No. 282.	D. Burns	Murray Building	B. Gossel	513 North Brodie St.	2nd and 4th Tuesdays in month.
International Longshoremen's Association (Coal Handlers), No. 746	N. Domenico	539 McLaughton Street.	A. Jarratt	739 Simpson Street	Call of President.
International Longshoremen's Association (Grain Trimmers), No. 479	W. Houston	133 S. Brodie Street	C. McLean	641 Prince Arthur Boulevard.	1st Wednesday in month.
International Association of Machinists, No. 309	F. Mable	Brodie Street	H. Stafford	133 Huron Street	1st and 3rd Tuesdays in month.
International Brotherhood of Maintenance of Ways Employees, No. 128	A. Armstrong	200 Leith Street	A. Rowe	320 N. Harold Street	4th Saturday in month.
International Brotherhood of Maintenance of Ways Employees, No. 277	A. Swain	Larson	W. Moore	Fort William	4th Sunday every alternate month.
International Moulders' Union No. 429	A. Baird	468 Mary Street	G. Taylor	314 Brock Street	1st Wednesday in month.
Operative Plasterers' International Union, No. 344	C. Boler	126 Rockwood Avenue Port Arthur	H. Attewell	347 N. Marks St., Fort William	2nd and 4th Fridays in month.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President	President's Address	Name of Secretary	Secretary's Address	Nights of Meeting
Fort William.—*Continued.*					
United Association Plumbers and Steam Fitters, No. 257.	J. Litter	217 Finlayson Street..	J. Looney	227 W. Francis Street..	2nd and 4th Tuesday in month.
Switchmen's Union of North America, No. 195	A. McGregor	323 Ogden Street	G. Revord	Port Arthur	1st Thursday and 3rd Sunday in month.
Brotherhood of Railway Trainmen, No. 306	T. Mower	118½ Bethune Street..	F. Hutchins	307 Finlayson Street..	1st and 3rd Sunday in month.
International Typographical Union, No. 417	D. Ross	219 Norah Street S....	G. Carter	Box 396, Fort William.	1st Saturday in month.
Galt:					
Journeymen Barbers' International Union, No. 413	A. Wilson	South Water Street...	J. Soutar	Box 174, Galt	Last Thursday in month.
Bricklayers', Masons' and Plasterers' International Union, No. 15	M. Haller	Preston P.O.	W. Johnston	Box 208, Hespeler	2nd Wednesday in month.
Federated Association of Letter Carriers, No. 39	J. Spooner	91 South Street	F. White	64 Park Avenue	1st Monday in month.
International Moulders' Union, No. 447	W. Heim	Galt	D. Melvin	Box 356, Galt	1st and 3rd Thursday in month.
American Federation of Musicians, No. 124	H. Fletcher	Forest Road	L. Schwartz	66 Water Street S	1st Sunday in month.
International Brotherhood of Painters, Decorators and Paperhangers, No. 906	A. Chepchase	67 Shade Street	A. McGregor	92 Cedar Street	1st and 3rd Friday in month.
Gananoque:					
International Union of Paving Cutters	W. Keniston	Gananoque	J. Round	Box 135, Gananoque...	2nd Monday in month.
Guelph:					
Journeymen Barbers' International Union, No. 310	F. H. Nosehay...	Guelph	F. Marriott	19 Mont Street	4th Monday in month.
Bartenders' International League, No. 104	W. Maloney	American Hotel	F. Smith	Priory Hotel	1st Friday in month.
Bricklayers', Masons' and Plasterers' International Union, No. 3	E. Simpson	13 George Street	J. Weekes	15 Glasgow Street	2nd and 4th Thursday in month.
Federated Association of Letter Carriers, No. 18	E. Wiswell	Carden Street	R. Masson	56 St. Arnaud Street..	1st Monday in month.

Moulders' International Union, No. 212	T. Leader	Essex Street	W. Parker	122 Essex Street	1st and 3rd Thursday in month.
American Federation of Musicians, No. 92	W. Copeland	5 Neeve Street	D. McGimsel	128 Palmer Street	1st Sunday in month.
Piano and Organ Workers Union, No. 34	J. Camidge	23 Earl Street	C. Griffenham	10 Glasgow Street S.	3rd Wednesday in month.
Journeymen Tailors' Union of America, No. 297	L. Stewart	Guelph	Miss T. Aslett	130 Oxford Street	1st Monday in month.
Hamilton:					
Journeymen Barbers' International Union, No. 131	E. Bayne	1½ James Street	H. Halford	59 John Street	1st and 3rd Monday in month.
Bartenders' International League, No. 197	G. Hibberd	463½ King Street E.	R. Lanaway	293 Hughson Street N.	1st and 3rd Sunday in month.
International Brotherhood of Bookbinders, No. 114	H. Arbuckle	20 Wellington Street	T. Saunderson	120 Locke Street N.	1st Monday in month.
Boot and Shoe Workers Union, No. 228	J. Gimblett	110 East Avenue	H. Harrison	43 Melbourne Street	3rd Tuesday in month.
Boot and Shoe Workers Union, No. 232	E. Peters	119 Peters Street	T. Connell	33 Steven Street	4th Friday in month.
Boot and Shoe Workers Union, No. 234	Mrs. T. Epps	13 Aikman Avenue	Ethel Copeland	132 Markland Street	4th Thursday in month.
Boot and Shoe Workers Union, No. 444	L. Vann	192 Market Street	F. Wills	Wellington Street	2nd Friday in month.
International United Brewery Workers, No. 312	G. King	West Avenue	J. Baxter	199 Bay Street N.	2nd and 4th Tuesday in month.
Bricklayers', Masons' and Plasterers' International Union, No. 1	H. Callahan	Roslyn Avenue	J. Laing	164 Robinson Street	Every Thursday in month.
International Broom and Whisk Makers, No. 9	J. Durrand	122 Peter Street	W. McAdam	90 Catharine Street	2nd Monday in month.
Builders' Labourers' Union No. 1	J. Smart	Hamilton P.O.	W. Sanders	60 Fullerton Avenue	Alternate Wednesdays in month.
United Brotherhood Carpenters and Joiners, No. 18	W. Smith	100 Inchbury Street	A. Blythe	49 Wellington St. N.	1st, 3rd and 5th Tuesdays in month.
United Brotherhood Carpenters and Joiners, No. 2612	S. Kersey	190 Forest Avenue	A. Burton	46 Garfield Ave. S.	Alternate Fridays in month.
United Brotherhood Carpenters and Joiners, No. 2659	G. Gooding	Somerville Avenue	F. Smith	33 William Street	Alternate Thursdays in month.
American Brotherhood Cement Workers, No. 170	J. McNab	29 Napier Street	W. Irving	22 Victoria Ave. S.	1st and 3rd Thursday in month.
Cigarmakers' International Union, No. 55	J. Sullivan	105 Locke Street S.	F. Hough	170 Duke Street	2nd Tuesday in month.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President	President's Address	Name of Secretary	Secretary's Address	Nights of Meeting.
Hamilton.—*Continued.*					
Order of Railway Conductors, No. 27	H. Mandar	142 Strachan Street	A. Cameron	297 York Street	1st and 3rd Sunday in month.
International Brotherhood of Electrical Workers, No. 390	F. Snyder	Hamilton	A. Laxton	Main Street	2nd and 4th Friday in month.
Brotherhood of Locomotive Engineers, No. 133	J. Oliver	198 Locke Street	A. Griffitt	193 Napier Street	2nd and 4th Sunday in month.
Canadian Asso. Stationary Engineers, No. 2	A. Swazie	163 Rebecka St.	A. Heath	111 Burris Street	1st and 3rd Thursday in month.
United Garment Workers' Union, No. 219	R. Tansley	118 Catharine St.	S. Cole	82 Vine Street	4th Tuesday in month.
United Garment Workers' Union, No. 256	M. Levine	25 Bailey St.	L. Smith	244 Jackson Street W.	1st and 3rd Wednesday in month.
Amalgamated Glass Workers' International Association No. 33	E. Lee	105 Locomotive St.	W. Milton	226 King Street W.	1st and 3rd Sunday in month.
International Association of Granite Cutters of America.	J. Smith	Herkimer & Locke Sts.	W. Fletcher	105 Canada Street	Call of President.
Journeymen Horseshoers' International Union, No. 72	A. Vivian	308 Herkimer St.	A. Jaffrey	62 William St.	2nd and 4th Wednesday in month.
Federal Labour Union, No. 11.	G. Gimblett	238 Jackson St. W.	J. Hotrum	251 Wellington St. N.	1st Monday in month.
International Wood, Wire and Metal Lathers, No. 145	J. Gilchrist	51 McNab St. N.	G. Potter	6 St. Patrick Street	1st and 3rd Wednesday in month.
International Association of Machinists, No. 414	H. Stewart	43 Tisdale St.	R. Higginson	31 Oak Avenue	Every Wednesday in month.
International Moulders' Union No. 26	H. Trennum	300 Catharine St. N.	A. Irwin	131½ John Street N.	Every Wednesday in month.
American Federation of Musicians, No. 293	H. Casel	43 Barton St. W.	J. Gimblett	110 East Avenue N.	2nd Sunday in month.
Brotherhood of Painters, Decorators and Paperhangers No. 205	M. Price	James St. N.	J. Boulter	9 Nightingale Street	1st and 3rd Monday in month.
Moving Picture Operators' Protective Union, No. 303	M. Bartleman	214 Hurdura St.	S. Murphy	25 Vine Street	2nd Sunday in month.
Operative Plasterers' International Union, No. 298	E. Spiller	74 Locomotive St.	W. Pindar	204 Bay Street S.	1st and 3rd Thursday in month.

United Association Plumbers and Gas Fitters, No. 67	J. Cunningham	71 Chatham St.	A. Harris	28 Smith Avenue	1st and 3rd Wednesday and every Saturday evening.
International Printing Pressmen and Assistants, No. 176.	F. Maxted	Herald Printing Co.	W. Berry	193 Market Street	4th Wednesday in month.
International Metal Polishers and Buffers, No. 26	M. Daycott	17 Edward St.	M. Irvine	56 Edinburgh Avenue	1st and 3rd Wednesday in month.
Sheet Metal Workers' International Alliance, No. 61	F. Dunnett	87 Emerald St. N.	R. Towler	423 John Street N.	1st and 3rd Friday in month.
Journeymen Stonecutters of North America	S. Lawrence	12 Chestnut Ave.	J. Conway	62 Wentworth St. N.	2nd and 4th Thursday in month.
Stove Mounters' International Union, No. 35	W. Keegan	67 St. Matthew Ave.	T. Bevers	25 Tisdale Street	1st Monday in month.
Amalgamated Association of Street and Electric Railway Employees, No. 107	J. Adams	32 Madison Ave.	E. Batt	63 Aikman Avenue	2nd and 4th Saturday in month.
Stereotypers and Electrotypers International Union No. 113	W. Hipkins	227 York St.	G. Wills	240 Hunter Street E.	1st Monday in month.
Tailors' Industrial Union (Int.), No. 149	C. Smith	300 Bold St.	J. Musgrove	103 Argus Street	3rd Monday in month.
Order of Railway Telegraphers No. 155	W. Kelly	91 Mulbery St.	E. Armstrong	Box 98, Smithville	2nd Sunday in month.
International Alliance of Theatrical Stage Employees No. 129	W. Knapman	15 Huron St.	E. Nally	Box 244, Hamilton	4th Sunday in month.
International Tobacco Workers' Union, No. 48	J. Hueston	188 Caroline St.	A. Broughton	22 Hunt Street	2nd and 4th Sunday in month.
Brotherhood of Railway Trainmen, No. 226	R. Potticary	96 Stanley Ave.	A. Smith	25½ Melbourne Street	2nd and last Sunday in month.
Havelock:					
Order of Railway Conductors No. 578	W. Jones	Havelock	J. Garratt	Havelock	1st Wednesday in month.
Brotherhood of Locomotive Engineers, No. 658	R. Jack	Havelock	H. Francis	Havelock	2nd and 4th Monday in month.
Brotherhood of Railway Trainmen, No. 293	J. Kelsey	Havelock	W. Green	Box 103, Havelock	2nd and 4th Thursday in month.
Heron Bay:					
International Brotherhood of Maintenance of Ways Employees, No. 231	J. Leewell	Heron Bay	A. Bianconi	Jack Fish	Last Saturday in month
Ingersoll:					
International Brotherhood of Maintenance of Ways Employees, No. 503	M. Sprogue	Ingersoll	D. McCord	Belmont	Call of President.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President	President's Address	Name of Secretary	Secretary's Address	Nights of Meeting
Kenora:					
Brotherhood of Railway Carmen, No. 236	R. Neil	Kenora	F. Connett	24 First Street	3rd Friday in month.
Order of Railway Conductors, No. 352	C. Simpson	Kenora	H. Hargrave	Box 34, Kenora	1st Tuesday and 3rd Sunday in month.
Brotherhood of Locomotive Engineers, No. 535	J. Preston	Kenora	J. Penney	Box 69, Kenora	1st Wednesday and 3rd Sunday in month.
International Association of Machinists, No. 28	A. Niel	Box 199, Kenora	F. Nighswander	Box 151, Kenora	3rd Monday in month.
Order of Railway Telegraphers No. 7	G. Robertson	Welland	R. Wilton	Kenora	Call of President.
Brotherhood of Railway Trainmen, No. 270	J. Lett	Box 126, Kenora	J. Closkey	Box 109, Kenora	2nd and 4th Wednesday in month.
Kingston:					
Journeymen Barbers' International Union, No. 514	W. Christlay	288 Princess St	W. Lemmon	219 University Avenue	Last Monday in month
Bricklayers', Masons' and Plasterers' International Union No. 10	G. Mowat	Division St	A. Fowler	323 Johnston Street	2nd and 4th Tuesday in month.
United Brotherhood Carpenters and Joiners, No. 249	D. Wright	Livingston Ave	W. Hubble	26 Quebec Street	2nd and 4th Monday in month.
National Association of Marine Engineers, No. 4	S. Murray	20 Rideau St	J. Gillie	101 Clergy Street	Every Monday in month
International Building Labourers' Union, No. 66	G. Wilkinson	445 Alfred St	W. Baxter	154 Rideau Street	1st and 3rd Wednesday in month.
Federated Association of Letter Carriers, No. 8	G. Little	16 Nelson St	G. Compton	P.O., Kingston	1st Wednesday in month.
Amalgamated Sheet Meta' Workers, No. 117	E. Ada	11 Deacon St	N. Davie	Montreal Street	1st and 3rd Friday in month.
International Moulders' Union No. 252	P. Friedman	Anglo-American Hotel Ontario St	J. Clark	Princess Street	1st and 3rd Monday in month.
International Brotherhood of Painters, Decorators and Paperhangers, No. 114	E. Dunpty	19 Plumb St	W. Edgar	374 Alfred Street	1st and 3rd Tuesday in month.
United Association of Plumbers and Steam Fitters, No. 221	F. Belwa	148 Montreal St	T. Bromeley	67 Collingwood Street	1st and 3rd Tuesday in month.

Journeymen Stonecutters' Association of North America.	G. Burton	432 Alfred St.	P. O'Brien	21 Clergy Street	2nd Tuesday in month.
Journeymen Tailors' International Union, No. 263	R. Alexander	451 Albert St.	J. Sauve	29 Brock Street	1st and 3rd Monday in month.
Kingsville:					
Tobacco Workers' International Union, No. 71	Mrs. Bluhm	Queen St.	P. Pearce	Queen Street	. . . . .
Leamington:					
United Brotherhood Carpenters and Joiners, No. 2613	M. Swatman	Box 96, Leamington	E. Narraway	Box 296, Leamington	Alternate Fridays in month.
International Brotherhood of Maintenance of Ways Employees, No. 302	G. Lambier	Erie St. N.	W. Howe	Box 368, Kingsville	Last Saturday in month.
Lindsay:					
Order of Railway Conductors No. 322	F. Horner	Lindsay	W. Hodgson	Box 581, Lindsay	1st and 2nd Sunday in month.
Brotherhood of Locomotive Firemen and Enginemen No. 136	A. Busbie	Box 212, Lindsay	W. Graham	Box 212, Lindsay	. . . . .
Brotherhood of Locomotive Engineers, No. 174	W. Chambers	Box 205, Lindsay	T. Wilkinson	Box 205, Lindsay	2nd and 4th Sunday in month.
Brotherhood of Railway Trainmen, No. 308	W. McCarty	Box 528, Lindsay	N. Abbot	Box 346, Lindsay	2nd and 4th Sunday in month.
London:					
Bartenders' International League, No. 137	C. Stroms	Savoy Hotel	H. Edsall	58 Colborne Street	2nd and 4th Sunday in month.
International Alliance Billposters and Billers, No. 22	W. Cooney	196 Queen's Ave.	C. Vincent	673 Lorne Avenue	1st Monday in month.
International Brotherhood of Bookbinders, No. 206	G. Anundson	484 Central Ave.	C. Barnes	561 St. James Street	2nd Friday in month.
International Brewery Workers' Union, No. 381	R. Warren	1028 Francis St.	E. Norman	229 Talbot Street	3rd Thursday in month
Bricklayers', Masons' and Plasterers' International Union, No. 5	H. Hicks	498 St. James St.	H. Rymill	491 Oxford Street	2nd and 4th Wednesday in month.
United Brotherhood Carpenters and Joiners, No. 1946	W. Ellis	20 Alexander St.	J. Hill	P.O. Sub. 6, Knollwood Park, London	Every Tuesday in month.
Cigarmakers' International Union, No. 278	A. Ryall	420 Hill St.	W. Heslop	23 Mile Street	1st and 3rd Tuesday in month.
Order of Railway Conductors, No. 16	F. Broad	311 Hyman St	H Heath	250 Queen's Avenue	1st and 3rd Sunday in month.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President	President's Address	Name of Secretary	Secretary's Address.	Nights of Meeting
London.—*Continued.*					
International Brotherhood of Electrical Workers, No. 120.	E. Ingles.....	85 Clarence St.....	—. McArthur ...	Sub. No. 4. London ...	2nd and 4th Thursday in month.
Brotherhood of Locomotive Engineers, No. 68	J. Porteous	374 York St.....	J. Irwin	745 Dundas Street ...	1st Sunday and 3rd Thursday in month.
Brotherhood of Locomotive Engineers, No. 528	G. Blencoe	541 Princess St.....	G. Dowling	583 Central Avenue ..	1st and 3rd Sunday in month.
Amalgamated Society of Engineers, No. 809	G. Heathcote	85 Smith St.....	G. Scollick	583 Grey Street	2nd Friday in month.
Canadian Association of Stationary Engineers, No. 30 ..	J. Middleton	128 York St.....	W. Walters	43 Euclid Avenue	2nd and 4th Friday in month.
Brotherhood of Locomotive Firemen and Enginemen No. 117	W. Moore	837 Lovett St.....	W. McCall	379 Hamilton Road ...	1st Wednesday and 3rd Sunday in month.
Brotherhood of Locomotive Firemen and Enginemen No. 468	D. McAuley	939 Lorne Ave.....	C. Phipps	830 Lorne Avenue	2nd and 4th Sunday in month.
Federated Association of Letter Carriers, No. 4	E. Smith	493 Oxford St.....	W. Corpe	130 Grey Street	1st Monday in month.
International Association of Machinists, No. 383	M. St. Clair	Hillcrest	A. Edwards	514 Quebec Street	2nd and 4th Tuesday in month.
International Brotherhood of Maintenance of Ways Employees, No. 195	D. Campbell	8 Thornton Ave.....	D. Walsh	381 Central Avenue ...	Last Saturday in month.
International Brotherhood of Maintenance of Ways Employees, No. 497	R. Huston	173 Rectory St.....	T. Chittim	551 York Street	Last Thursday in month.
American Federation of Musicians, No. 279	H. Wooster	210 Wharncliffe Road..	C. Perrin	352 Adelaide Street ...	4th Sunday in month.
International Union of Metal Polishers, Buffers, Platers and Brass Workers, No. 32.	D. Eldridge	522 Charlotte St.....	C. Bailey	85 Hamilton Road	2nd and 4th Friday in month.
International Union of Printing Pressmen and Assistants, No. 173	C. Hollins	270 Horton St.....	H. Symthe	90 Dreamy Avenue ...	1st Monday in month.
Journeymen Stonecutters' Association of North America	T. Harper	2 Shirley Ave.....	H. Boyd	875 Adelaide St., London	1st and 3rd Friday in month.

Order of Railway Telegraphers, No. 1	L. Eddy	Marcellus, Mich.	D. Shaw	867 Waterloo Street London	Call of Chairman.
International Alliance of Theatrical Stage Employees No. 105	W. Burrows	225 Grey St.	G. McFadden	315 Ottaway Avenue	1st and 3rd Sunday in month.
Brotherhood of Railway Trainmen, No. 240	T. White	10 Nelson St.	W. Harris	27 Victor Street	1st and 3rd Sunday in month.
Brotherhood of Railway Trainmen, No. 415	P. Kelliher	850 Princess Ave.	L. Johnston	478 Central Avenue	2nd and 4th Sunday i month.
International Typographica' Union, No. 133	F. Wanless.	74 Byron Ave.	W. Ruse	120 Wilson Avenue	1st Thursday in month.
Midland:					
International Longshoremens' Association, No. 199	J. Lesprances.	Midland	D. Hall	Midland	1st and 3rd Tuesday in month.
Milverton:					
Int. Brotherhood of Maintenance of Ways Employees, No. 163	R. McCord	40 Perth St., Guelph.	J. Elliott	Milverton	. . . . .
Mimico:					
Brotherhood of Locomotive Firemen and Enginemen, No. 756	T. Heuston	36 Galley Ave.	A. Shaw	Box 191, Mimico	1st and 3rd Thursdays in month.
Muskoka:					
Int. Brotherhood of Maintenance of Ways Employees, No. 217	J. McCrackin	Craighurst P.O.	R. Treadwell	Midhurst	Every 3 months, last Saturday.
Niagara Falls:					
Bricklayers', Masons', and Plasterers' Int. Union, No. 27	. . . . .	. . . . .	A. Mustoe	92 First Ave.	Every Thursday in month.
United Brotherhood Carpenters and Joiners, No. 2624	W. Leake	Niagara Falls	W. Bromhall	74 Victoria St. S.	2nd and 4th Fridays in month.
Brotherhood of Locomotive Firemen and Enginemen. No. 487	W. Stuart	224 Bridge St.	S. Lovell	19 Ellis St.	2nd and 4th Wednesday in month.
Federated Association of Letter Carriers, No. 36	G. Donald	96 Huron St.	R. Ross	81 McRae St.	1st Wednesday in month.
Brotherhood of Railway Trainmen, No. 379	C. Ortt	13 Ellis St.	I. Strange	149 Victoria Ave.	1st and 4th Fridays in month.
North Bay:					
Int. Brotherhood of Blacksmiths, No. 474	R. Foresythe	North Bay P.O.	W. Peever	260 Cassels St.	Last Wednesday in month.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President	President's Address	Name of Secretary	Secretary's Address	Nights of Meeting.
North Bay.—*Continued.*					
International Brotherhood of Boilermakers and Iron Ship Builders, No. 417	M. Milton	Second St.	F. Crowther	North Bay	2nd and 4th Mondays in month.
United Brotherhood Carpenters and Joiners, No. 2625.	S. Scott	Box 1296, North Bay	R. Sharp	Box 1296, North Bay	1st and 3rd Mondays in month.
Brotherhood of Railway Carmen, No. 192	R. Dodgson	North Bay	R. Moffatt	North Bay	1st and 3rd Thursdays in month.
Brotherhood of Locomotive Firemen and Enginemen, No. 791	S. Neusman	Box 1060, North Bay	R. Vincent	Box 660, North Bay	2nd and 4th Sundays in month.
Order of Railway Conductors, No. 242	A. Garretson	Cedar Rapids, Iowa	J. Falby	Box 287, North Bay	2nd Monday in month.
International Association of Machinists, No. 413	T. Warner	McIntyre St. E.	J. Franklin	232 Fisher St. E.	2nd and 4th Wednesday in month.
International Brotherhood of Maintenance of Ways Employees, No. 244	S. Frost	Box 830, North Bay	D. Wilson	Box 58, Mattawa	Last Saturday in month.
Brotherhood of Railway Trainmen, No. 249	J. Bradford	North Bay	J. McKerrow	Box 292, North Bay	2nd and 4th Sundays in month.
Orangeville:					
International Brotherhood of Maintenance of Ways Employees, No. 214	W. Neil	Orangeville	R. McIntosh	345 14th St. E., Owen Sound	Last Saturday in March, June, Sept. and December.
Orillia:					
Bricklayers', Masons', and Plasterers', Int. Union, No. 18	R. Graham	Cedar St.	B. Glenister	Box 232, Cedar Island Orillia	1st and 3rd Wednesday in month.
Oshawa:					
Bricklayers', Masons', and Plasterers', Int. Union, No. 20	H. Canfield	Simcoe St.	C. Nicolls	Burk St., West, Mount	1st and 3rd Thursdays in month.
International Moulders' Union, No. 136	A. Robinson	Celina St.	L. Day	South Oshawa	3rd Thursday in month
Ottawa:					
Bricklayers', Masons', and Plasterers' Int. Union, No. 7	W. Bourne	Westboro' P.O.	A. Findlay	313 Sunnyside Ave.	Alternate Mondays in month.

Bricklayers', Masons', and Plasterers' Int. Union, No. 14	J. Cameron	265 Parkdale Ave.	J. Sandeman	182 Drummond St.	2nd Monday in month
International Brotherhood of Bookbinders, No. 173	F. Parent	47 Rue Maisonneuve, Hull, Que.	H. McDowell	335 James St.	2nd Friday in month.
United Brotherhood Carpenters and Joiners, No. 93	G. Law	144 Isabella St.	R. Vogan	13 Rosemount Ave.	2nd and 4th Wednesdays in month.
Brotherhood of Railway Carmen, No. 230	C. Leach	19 Armstrong Ave.	W. Shaw	123 Eccles St.	4th Thursday in month
Order of Railway Conductors, No. 29	W. Dickson	51 Third Ave.	J. Morris	305 Bronson Ave.	2nd and 4th Sundays in month.
Amal. Society of Engineers, No. 885	G. Webster	Ottawa	R. Matheson	Riverside Park	1st and 3rd Tuesdays in month.
Brotherhood of Locomotive Engineers, No. 168	J. Wilson	70 Elm St.	J. Chisholm	603 Wellington St.	2nd and 4th Sundays in month.
Brotherhood of Locomotive Engineers, No. 469	P. Roy	9 Second St.	I. Johnson	137 Hawthorne Ave.	Alternate Sundays in month.
Can. Association of Stationary Engineers, No. 473	M. Stevenson	49 Preston St.	C. Lake	12 Larch St.	2nd and 4th Wednesdays in month.
International Steam and Operating Engineers, No. 473	C. Lewis	21 Garling St.	C. Lake	12 Larch St.	2nd and 4th Wednesdays in month.
Brotherhood of Locomotive Firemen and Enginemen, No. 81	J. Halden	77 College Ave.	J. Eldridge	69 Frank St.	2nd and 4th Thursdays in month.
Brotherhood of Locomotive Firemen and Enginemen, No. 172	L. Smyth	59 Spadina Ave.	A. McIntosh	533 Somerset St.	2nd and 4th Fridays in month.
Federal Labour Union, No. 15	A. Chapman	65 Ellen St.	W. McBride	114 College Ave.	1st and last Wednesdays in month.
Federal Labour Union, No. 20	Miss M. Murphy	592 Albert St.	Miss C. O'Sullivan	317 Catharine St.	3rd Monday in month.
American Flint Glass Workers Union, No. 104	F. Beu	110 Rosemount Ave.	N. Adams	474 Somerset St.	Last Saturday in month.
International Association of Machinists, No. 412	E. Neumann	65 Anderson St.	E. Patterson	9 Norfolk Ave.	2nd and 4th Fridays in month.
International Association of Machinists, No. 825	R. Carson	24 Herridge St.	J. Vincent	59 Concord St.	1st and 3rd Wednesdays in month.
Int. Brotherhood of Maintenance of Ways Employees, No. 223	J. O'Hara	110 Rosemount Ave.	J. Martel	Hammond	4th Sunday in month.
Int. Moulders' Union, No. 280	J. Fagan	527 McLeod St.	H. Ralph	36 Bayswater Ave.	1st and 3rd Thursdays in month.
American Federation of Musicians, No. 180	J. Dalaney	Wellington St.	E. Cockburn	423 Lisgar St.	Last Sunday in month

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President	President's Address	Name of Secretary	Secretary's Address	Nights of Meeting.
Ottawa.—*Continued.*					
International Brotherhood of Painters, Decorators and Paperhangers, No. 200	H. Herbert	40 Turner St.	E. Brandt	57 Bayswater Ave.	1st and 3rd Wednesdays in month.
International Brotherhood of Papermakers, No. 34	W. Boiley	97 Wellington St.	R. Ross	Hull, Que.	1st and 3rd Sundays in month.
International Plasterers' Labourers' Union, No. 1	J. Robertson	70 Vittoria St.	C. Alexander	Cumming's Bridge P.O.	2nd and 4th Thursdays in month.
United Association Plumbers and Steamfitters, No. 71	E. Cold	32 Ellen St.	W. Fogarty	374 Slater St.	2nd and 4th Wednesdays in month.
Printing Pressmen's' International Union, No. 5	D. McCann	Ottawa	A. Larden	327 Bell St.	3rd Friday in month.
International Steel and Copper Plate Printers, No. 6	W. Kent	969 Wellington St.	J. Cotter	151 Hinton Ave.	1st Wednesday in month.
Journeymen Stonecutters' Association of North America	D. Rae	129 Pretoria Ave.	J. Jackson	Main St.	2nd and 4th Fridays in month.
Amal. Association of Street and Electric Railway Employees, No. 279	W. O'Meara	81 Armstrong St.	V. Boivin	23 Rose St.	1st and 3rd Fridays in month.
Jour. Tailors' Union of America, No. 143	R. Smith	462 McLeod St.	C. Milne	438 McLeod St.	3rd Monday in month.
Brotherhood of Railway Trainmen, No. 129	P. Boucher	144 Maple St.	H. Clarke	61 Lloyd St.	1st and 3rd Sundays in month.
Brotherhood of Railway Trainmen, No. 185	J. Maloney	62 Henderson Ave.	H. Brown	540 Lyon St.	Alternate Sundays in month.
Can. Typographical Union, No. 1	J. Patterson	51 Third Ave.	F. Guthaus	209 McKay St.	2nd Saturday in month.
Int. Typographical Union, No. 102	P. Draper	112 Florence St.	A. Sheppard	159 Stanley Ave.	1st Saturday in month.
Owen Sound:					
Bricklayers', Masons', and Plasterers' Int. Union, No. 11	W. Malcolm	624 Sixth St. E.	S. Maher	536 Eighth St. E.	1st and 3rd Wednesdays in month.
Can. Association of Stationary Engineers, No. 25	W. Hooey	1856 Third Ave. W.	W. Needham	2089 Third Ave. E.	Every Thursday in month.

International Moulders' Union, No. 413	E. Bayley	Third Ave. E.	C. Cashore	369 Tenth St. E.	1st and 3rd Wednesdays in month.
Jour. Stonecutters' Association of North America	A. Grant	344 13th St. W.	E. Gaskell	1132 4th Ave. E.	2nd and 4th Fridays in month.
Palmerston:					
Order of Railway Conductors, No. 492	D. Cox	15 Ragtin St.	W. Komph	Palmerston	
Brotherhood of Locomotive Firemen and Enginemen, No. 181	A. Deibel	Palmerston.	F. Riddell	Box 64, Palmerston	1st and 3rd Sundays in month.
Brotherhood of Locomotive Engineers, No. 518	J. Hodgins	Palmerston.	Otto Lors	Box 67, Palmerston	2nd and 4th Sundays in month.
Brotherhood of Railway Trainmen, No. 39	C. Mack	Palmerston.	E. Everitt	Palmerston	1st and 3rd Sundays in month.
Parry Sound:					
Brotherhood of Railway Carmen, No. 157	W. Tucker	Parry Sound P.O.	G. Slaughter	Box 608, Parry Sound	1st and 3rd Thursdays in month.
Brotherhood of Locomotive Engineers, No. 728	F. Hudson	Parry Sound	J. Napier	Parry Sound	1st and 3rd Sundays in month.
Int. Association of Machinists, No. 518	L. Nason	Bowes St.	J. Thompson	River St.	1st and 3rd Tuesdays in month.
Peterborough:					
Bartenders' Int. League, No. 293	J. Houlihan	Grand Hotel	J. Chambers	c-o Elliott & Co. Wholesale Liquor Store	Last Saturday in month.
Bricklayers', Masons', and Plasterers' Int. Union, No 17	D. Wires	Peterborough P.O.	W. Stevens	Box 928, Peterborough.	1st and 3rd Tuesdays in month.
International Brotherhood of Electrical Workers, No. 261	W. Cotton	277 Thomas St.	G. Snowden	31 St. James St.	2nd and 4th Wednesdays in month.
Federafed Association of Letter Carriers, No. 22	W. Stuart	284 Lansdowne St.	T. Edward	496 College St.	Last Wednesday in month.
Int. Brotherhood of Maintenance of Ways Employees, No. 211	J. Daly	146 Aylmer St.	C. Tummon	Leaside	Call of President.
Int. Moulders' Union, No. 191	G. Ahearn	496 Elm St.	W. Mowry	457 Cedar St.	1st and 3rd Thursdays in month.
Amal. Association of Street and Electric Railway Employees, No. 622	H. Smith	582 Bolivar St.	J. O'Connor	138 Park St.	1st Monday and 3rd Sunday in month.
Jour. Tailors' Union of America, No. 23			A. Ward	510 Water St.	4th Tuesday in month.
Int. Typographical Union, No. 248	G. Neyland	140 Autrim St.	G. Johnstone	635 Union St.	Last Saturday in month

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President	President's Address.	Name of Secretary	Secretary's Address.	Nights of Meeting.
Porcupine:					
Western Federation of Miners, No. 145	J. Nicol	Porcupine	M. McDonald	Box 521, Porcupine.	Sundays.
Port Arthur:					
Brotherhood of Railway Carmen, No. 347	C. Moss	85 Ontario St.	H. Cardy	166 Secord St.	3rd Wednesday in month.
United Brotherhood Carpenters and Joiners, No. 285	J. Buckingham	Y. M. C. A.	W. Robertson	37 Machar Ave.	1st and 3rd Mondays in month.
United Brotherhood Carpenters and Joiners, No. 2629	J. Hagan	231 Park St.	W. Mantle	218 Banning St.	2nd and 4th Mondays in month.
Order of Railway Conductors, No. 536	A. Spaulding	290 Pearl St.	J. Ferguson	27 Machar Ave.	Last Monday in month.
Int. Brotherhood of Electrical Workers, No. 367	O. Runkle	213 Powley St.	R. Burns	107 College St.	2nd and 4th Wednesdays in month.
Canadian Association of Stationary Engineers, No. 29	F. Nagle	270 Victor St., Fort William	S. Smith	506 Van Norman St., Port Arthur	Every Friday in month.
Brotherhood of Locomotive Firemen and Enginemen, No. 593	E. Schaubacher	310 Fort St.	W. Macdonald	195 Park St.	2nd and 4th Fridays in month.
Brotherhood of Locomotive Engineers, No. 631	D. Malcolm	358 Wiley St.	W. Nash	2 Machar Ave.	1st and 3rd Tuesdays in month.
Int. Association of Marine Engineers, No. 16	W. Falcona	392 Ambrose St.	E. Williams	142 Secord St.	Saturdays.
Int. Longshoremen's Asso. (Coal Handlers), No. 319	F. Colosimo	521 McLaughlin St., Fort William	J. Tiboni	521 McIntosh St., Fort William	Call of President.
Int. Association of Machinists, No. 820	H. Brown	Port Arthur	A. Boyd	368 Wiley St.	3rd Tuesday in month.
American Federation of Musicians, No. 489	W. Sara	9 Rattan St.	H. Wallender	117 S. Syndicate Ave.	2nd Sunday in month.
United Assoc. of Journeymen Plumbers, No. 378	T. Dennis	233 College St.	J. Lawrence	375 Waverley St.	2nd and 4th Fridays in month.
Jour. Stonecutters' Association of North America	J. Gibson	Jean St.	R. Paton	109 Empire Ave.	Alternate Wednesdays in month.
Int. Typographical Union, No. 575	H. Lawrence	7 Centre St.	T. Wynn	535 Court St. N.	2nd Tuesday in month.

Port Colborne:					
United Brotherhood Carpenters and Joiners, No. 1168..	L. White.....	Humberstone.	Ira Barnhardt ..	Box 68, Humberstone..	1st and 3rd Mondays in month.
Port Dover:					
Longshoremen's Int. Association (Fishermen), No. 21..	H. Misner	Port Dover	A. Lowe	Port Dover	Every Monday in month.
Port Hope:					
Int. Moulders' Union, No. 189	L. Nunn	Port Hope	C. McElroy	Box 505, Port Hope ..	1st and 3rd Mondays in month.
Preston:					
United Brotherhood Carpenters and Joiners, No. 931..	D. McGregor	Galt.....	T. Ainsworth....	Vine St., Preston	2nd and 4th Mondays in month.
Metal Polishers and Buffers No. 27	A. Wright	Preston P.O.	F. Schartzberg...	Box 374, Preston	3rd Friday in month.
Stove Mounters' Int. Union, No. 11	J. Hunter	Waterloo St.	J. Tobin	Dover St.	1st and 3rd Fridays in month.
Rainy River:					
Brotherhood of Railway Carmen, No. 436	R. Fowlie	Rainy River P.O.	W. Turner	Box 131, Rainy River .	1st and 3rd Thursdays in month.
Order of Railway Conductors, No. 30	A. Garretson ...	Cedar Rapids, Mich. .	S. McElroy	Box 236, Rainy River .	1st and 3rd Sundays in month.
Brotherhood of Locomotive Engineers, No. 749	H. Mills	Rainy River	D. Johnson	Box 154, Rainy River..	2nd and 4th Wednesdays in month.
Brotherhood of Locomotive Firemen and Enginemen, No. 750	A. Henderson ...	Box 37, Rainy River ..	F. Rasmussen ...	Box 136, Rainy River..	2nd and 4th Thursdays in month.
Brotherhood of Railway Trainmen, No. 828	J. Higgins	Rainy River	M. Whitney.....	Box 162, Rainy River..	2nd and 4th Sundays in month.
Ramsay Station:					
Int. Brotherhood of Maintenance of Ways Employees, No. 237	H. Mulligar	Chapleau	F. Darby	Woman River	Every Four months.
Redditt:					
Brotherhood of Railway Carmen, No. 549	C. Randall	Redditt	E. Dion	Redditt	3rd Saturday in month
Ridgeway:					
United Brotherhood Carpenters and Joiners, No. 1950.	F. Smith	Ridgeway	M. Miller	Ridgeway	2nd and last Tuesdays in month.
St. Catharines:					
Jour. Barbers' International Union, No. 1	J. Bessey	St. Paul St.	A. Haynes	293 St. Paul St.	1st and 3rd Mondays in month.
International Brewery Workmen, No. 305	J. Stack	22 Maple St.	S. Marriott	16 St. Paul St.	3rd Friday in month.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President	President's Address	Name of Secretary	Secretary's Address	Nights of Meeting.
St. Catharines:—*Continued.*					
Bricklayers', Masons', and Plasterers' Int. Union, No. 4	J. Johnston	St. Catharines	A. Greenlaw	29 Dacotah St.	Every Tuesday in month.
United Brotherhood Carpenters and Joiners, No. 38	J. Dunkles	6 McGhie St.	J. Carty	19 Cherry St.	Every Friday in month.
United Brotherhood Carpenters and Joiners, No. 2632	J. Hains	21 Delaware St.	C. Dunn	6 Duke St.	2nd and 4th Thursdays in month.
Cigarmakers' Int. Union, No. 140	W. Haynes	13½ Cherry St.	Leo Coyle	138 Church St.	1st Saturday in month.
Int. Brotherhood of Electrical Workers, No. 303	W. Grenville	Thomas St.	C. Walters	c-o Clifford Electric, Ltd.	1st and 3rd Mondays in month.
Federated Association of Letter Carriers, No. 17	R. Jeeves	45 Wellington St.	A. Welsh	30 Queenston St.	1st and 3rd Tuesdays in month.
Int. Association of Machinists, No. 268	W. Dewey	110 Welland Ave	J. Rothwell	58 Lake St.	2nd and 4th Fridays in month.
Int. Moulders' Union, No. 385	H. Gray	63 Queenston St.	H. Gray	63 Queenston St.	2nd and 4th Tuesdays in month.
Brotherhood of Painters, Decorators and Paperhangers, No. 407	C. O'Donnell	2 Court St.	W. Outram	30 Nelson St.	2nd and 4th Wednesdays in month.
Tailors' Int. Industrial Union, No. 235	J. Coyle	Grand Central Hotel	J. Wiley	9 Louisa St.	1st Wednesday in month.
Int. Typographical Union, No. 416	B. Gadsby	35 Haynes Ave.	J. Booker	188 Lake Ave.	Last Monday in month.
St. Mary's:					
Jour. Stonecutters' Association of North America	C. Frank	St. Mary's.	W. McCauley	St. Mary's	2nd and 4th Tuesdays in month.
St. Thomas:					
Canadian Blacksmiths and Helpers, No. 94	J. Lumley	11 West Ave.	J. Wall	84 Chestnut St.	1st and 3rd Tuesdays in month.
Boilermakers and Helpers of America, No. 413	J. King	35 Balaclava St.	F. Roberts	61 Wilson Ave.	2nd and 4th Tuesdays in month.
Bricklayers', Masons' and Plasterers' Int. Union, No. 8	C. Heard	34 Hincks St.	O. Beal	83 Erie St.	2nd and 4th Wednesdays in month.

United Brotherhood Carpenters and Joiners, No. 1798	J. Shepherd	87 Forest Ave.	C. Willsie	5 Wolfe St.	1st and 3rd Fridays in month.
Cigarmakers' International Union, No. 420	A. Kimber	Hiawatha St.	A. Cook	91 Hiawatha St.	1st Friday in month.
Order of Railway Conductors, No. 13	E. Adderman	58 Chestnut St.	J. Ryan	31 Jonas St.	2nd and 4th Sundays in month.
Brotherhood of Locomotive Engineers, No. 132	T. Quirk	Queen's Hotel	T. Duffey	Wellington St.	Every Monday in month.
Brotherhood of Locomotive Engineers, No. 529	J. McGregor	Yarwood St.	A. Martin	52 Manitoba St.	Every Tuesday in month.
Brotherhood of Locomotive Engineers, No. 661	C. Wilson	43 Southwick St.	H. Buckpit	45 Mitchell St.	Every Wednesday in month.
Amalgamated Society of Engineers, No. 813	H. Worley	83 Woodward Ave.	R. Edleston	1 Smith Ave.	Alternate Mondays in month.
Brotherhood of Locomotive Firemen and Enginemen, No. 5	W. Scott	24 Maple St.	T. Casey	109 Forest Ave.	Every Friday in month.
Federated Association of Letter Carriers, No. 23	J. McDonald	132 Alma St.	C. Shuchcombe	37 Owaissa St.	1st of month.
International Association of Machinists, No. 294	G. Heard	Malakoff St.	J. Stewart	56 Redan St.	1st and 3rd Tuesdays in month.
Brotherhood of Railway Signalmen, No. 27	W. Fallis	44 Erie St.	J. Rinch	St. Thomas	2nd Fridays in month.
Journeymen Tailors' Union of America, No. 141	R. Skinner	Yarwood St.	W. Abernethy	30 Ross St.	4th Monday in month.
Brotherhood of Railway Trainmen, No. 47	A. Johnson	78 Karns St.	N. Sharp	2 John St.	Every Monday in month.
Sarnia:					
Brotherhood of Locomotive Engineers, No. 240	H. Boody	Vidal St. S.	J. Copeland	140 Savoy St.	Alternate Thursdays in month.
International Longshoremens' Association, No. 253	J. Foster	246 River St.	B. Shultes	246 River St.	1st and 3rd Fridays in month.
Sault Ste. Marie:					
Bricklayers', Masons' and Plasterers' Int. Union, No. 16	H. Mebert	67 St. George Ave.	W. Ramsay	408 Wellington St.	Every Tuesday in month.
Order of Railway Conductors, No. 429	F. Swift	526 Elizabeth St.	J. Hawkshaw	c-o A. C. R.	1st Sunday in month.
Federated Association of Letter Carriers, No. 42	R. Michimins	Pardee Ave.	J. Smith	72 Pine St.	Every Tuesday in month.
Brotherhood of Locomotive Engineers, No. 67	J. Cleminson	444 John St., Steelton	A. Wagner	347 Queen St.	1st and 3rd Wednesdays in month.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address	Name of Secretary	Secretary's Address	Nights of Meeting.
Sault Ste. Marie.—*Continued.*					
Brotherhood of Locomotive Firemen and Enginemen, No. 606	J. Robb	129 Salsbury Ave.	T. Rolph	191 Church St.	1st and 3rd Saturdays in month.
International Association of Machinists, No. 485	J. Pratt	120 Tancard St., Sault St. Marie	H. Mearns	Steelton	1st and 3rd Thursdays in month.
International Brotherhood of Maintenance of Ways Employees, No. 491	W. Wamsley	Echo Bay	W. Jewkes	269 Bruce St.	Last Saturday in month.
International Moulders' Union, No. 391	J. Durrance	Sault Ste. Marie	G. Pitcher	Box 40, Sault Ste. Marie.	3rd Friday in month.
International Brotherhood of Papermakers, No. 133	L. Shields	Steelton P.O.	V. Page	152 Central Park Ave., Sault Ste. Marie	2nd and 4th Sundays in month.
United Association of Plumbers, etc., No. 414	E. Pim	510 Bay St.	J. Dew	275 Bruce St.	2nd and 4th Thursdays in month.
Brotherhood of Railway Trainmen, No. 611	A. Senior	161 Albert St.	H. McColl	Steelton P.O.	2nd and 4th Fridays in month.
Schreiber:					
Order of Railway Conductors, No. 573	W. Hoskins	Schreiber	J. Corbett	Box 37, Schreiber	1st and 4th Tuesdays in month.
Brotherhood of Locomotive Engineers, No. 562	T. Arnot	Schreiber	W. Furlonger	Box 57, Schreiber	1st and 3rd Fridays in month.
Brotherhood of Locomotive Firemen and Enginemen, No. 387	C. Bowles	Box 232, Schreiber	E. Cambridge	Box 55, Schreiber	1st Sunday and 3rd Wednesday in month.
International Association of Machinists, No. 69	W. Lester	Schreiber	F. Reid	Schreiber	2nd and 4th Thursdays in month.
International Association of Machinists (Helpers), No. 927			G. Ree	Box 286, Schreiber	1st and 3rd Thursdays in month.
Brotherhood of Railway Trainmen, No. 419	J. Ross	Schreiber	R. Bell	Box 22, Schreiber	1st and 3rd Sundays in month.
Silver Centre:					
Western Federation of Miners, No. 148	A. McGrath	Silver Centre	F. Gaffney	Silver Centre	Every Sunday in month.

Simcoe:					
United Brotherhood Carpenters and Joiners, No. 2634..	J. Pratt	Simcoe P.O.	J. Dickson	Box 105, Simcoe	1st and 3rd Thursdays in month.
Smith's Falls:					
Bricklayers, Masons and Plasterers Int. Union, No. 21....	J. Gardiner	Smith's Falls P.O.	A. Johnston	Box 231, Smith's Falls.	2nd and 4th Wednesdays in month.
United Brotherhood Carpenters and Joiners, No. 1047..	H. Lawford	Smith's Falls P.O.	W. Tynan	Smith's Falls P.O.....	2nd and 4th Fridays in month.
Brotherhood of Locomotive Engineers, No. 381	A. Boyd	Smith's Falls P.O.	G. McGlaughlin .	Box 342, Smith's Falls.	1st and 3rd Tuesdays in month.
Brotherhood of Locomotive Firemen and Enginemen, No. 381	E. Mills	Smith s Falls	W. Young	17 Elmsley St.	2nd and 4th Mondays in month.
International Brotherhood of Maintenance of Ways Employees, No. 136	W. Mapwell	Smith s Falls	H. Hewitt	Mountain	Last Saturday in Sept., Dec., March and June.
International Moulders' Union, No. 201	J. Vanexan	Brockville St.	G. Crate	Box 263, Smith's Falls.	1st and 3rd Tuesdays in month.
Brotherhood of Railway Trainmen, No. 527	J. Thomas	27 Russell St.	J. Goldsmith	20 McCann St.	1st Monday and 3rd Wednesday in month.
Stratford:					
Brotherhood of Boilermakers and Helpers, No. 3	F. Williams	124 Perth St.	W. Pepper	120 Nelson St.	1st and 3rd Fridays in month.
Bricklayers, Masons and Plasterers Int. Union, No. 24...	G. Wilson	82 Nelson St.	W. Lewis	107 Milton St.	2nd and 4th Thursdays in month.
United Brotherhood Carpenters and Joiners, No. 1238..	H. Harding	262 Forman Ave.	H. Taylor	47 Chestnut St.	1st Monday in month.
Cigarmakers' International Union. No. 424.....	M. Whalen	111 Nile St.	J. Hagarty	179 St. David St.	1st Wednesday in month.
Order of Railway Conductors, No. 15	M. Hushin	137 Nile St.	R. Buchanan	37 Milton St.	2nd and 4th Sundays in month.
Amalgamated Society of Engineers, No. 597.....	H. Dickie	Guelph St.	W. Kidnew	108 Mowat St.	Alternate Saturdays in month.
Brotherhood of Locomotive Engineers, No. 188.....	W. Brown	141 Duro St.	W. O'Brien	245 Water St.	1st and 3rd Sundays in month.
Brotherhood of Locomotive Firemen and Enginemen, No. 38	F. Kennard	143 Well St.	J. Spencer	24 Ballentyne Ave.....	2nd and 4th Saturdays in month.
Brotherhood of Painters, Decorators and Paperhangers, No. 746	A. Simpson	Caledonia St.	W. Hall	14 Argyle St.	Every Tuesday in month.
International Typographical Union, No. 139.....	G. Wreford	175 St. David St.	C. McDonald	17 Nile St.	2nd Monday in month.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address	Name of Secretary	Secretary's Address	Nights of Meeting.
Sudbury:					
Bartenders' International League, No. 237	A. Gatieu	Elm Street	A. Ranger	106 Ignatius Street	2nd Sunday in month.
Bricklayers', Masons' and Plasterers' Inter. Union, No. 31	C. Carmichal	398 Nelson Street	F. Warrington	343 Mabel Avenue	1st and 3rd Wednesdays in month.
International Brotherhood of Maintenance of Ways Employees, No. 40	F. Hooper	Parry Sound P.O.	G. Roofs	Burwash P.O.	Last Saturday in month.
Thorold:					
International Brotherhood of Steam Shovel and Dredgemen, No. 55	E. McCann	Thorold	T. McGovern	Thorold	2nd Sunday in month.
International Brotherhood of Papermakers, No. 101	F. Hickey	Grand Central Hotel	J. Farrell	6 Welland Avenue	2nd and 4th Sundays in month.
Toronto:					
Asbestos Workers' International Union, No. 20	W. Scott	1531 Dundas Street	J. Forbes	96 Curzon Street	2nd and 4th Wednesdays in month.
Bakers' and Confectioners' Canadian Union, No. 90	H. Stewart	58 Belmont Street	R. Duval	112 Wolseley Street	1st Saturday in month.
International Bread Wagon Drivers' Union, No. 181	B. Goldhar	42 Alice Street	M. Greenberg	95 Agnes Street	Every Tuesday in month.
Journeymen Barbers' International Union, No. 517	E. Price	345 Broadview Avenue.	G. Robinson	609 Logan Avenue	4th Thursday in month.
Bartenders' International League, No. 280	S. Riggs	210 Queen Street E.	A. Leary	240 Havelock Street	4th Sunday in month.
National Brotherhood of Boilermakers and Helpers, No. 1	J. Mack	360 Wellington Street	J. Higgins	573 Perth Avenue	2nd and 4th Fridays in month.
International Brotherhood of Boilermakers and Helpers, No. 548	J. Dobson	280 Perth Avenue	J. Walker	169 Mulock Avenue	2nd and 4th Wednesdays in month.
International Brotherhood of Bookbinders, No. 28	L. Smith	95 Brooklyn Avenue	W. Sullivan	Labour Temple	2nd Monday in month.
Canadian National Bookbinders' Union, No. 1	F. Martin	43 Salem Avenue	G. Cole	39 Markham Street	1st and 3rd Mondays in month.
Boot and Shoe Workers' International Union, No. 233	A. Headley	101 Essex Avenue	W. Brown	22 Wascana Avenue	Every Monday in month.

Brass, Bronze and Wire Workers' Union, No. 139....	W. Brown	1025 Shaw Street.....	J. Davies.....	Toronto	2nd and 4th Fridays in month.
International Brewery Workers' Union, No. 304	F. Horgan	Toronto	J. Corcoran	Labour Temple	2nd and 4th Fridays in month.
International Brewery Workers' Union, No. 317	J. Dowling	119 Leslie Street	A. Cheeseman ...	62 Greenwood Ave.....	2nd and 4th Thursdays in month.
Bricklayers,' Masons' and Plasterers' Inter. Union, No. 2..	G. Miles	6 Croft Street	J. Bamber	Labour Temple.....	Every Tuesday in month.
Bricklayers', Masons' and Plasterers' Inter. Union, No. 26..	A. Herd	403 Montrose Avenue..	J. McLeod	91 Munro Street	1st and 3rd Thursdays in month.
International Associated Bridge and Structural Iron Workers' Union, No. 4	A. Wilson	285 George Street	W. Gracie	343 Symington Avenue.	1st and 3rd Tuesdays in month.
Builders' Labourers' Union, No. 1	C. Hunter	69 Shannon Street.....	C. Ayley	260 Sackville Street ...	Every Tuesday in month.
Brotherhood of Railway Carmen, No. 258	C. Pleasance	Mount Dennis	W. Pooler	25 Westmoreland Ave...	3rd Wednesday and 4th Tuesday in month.
Brotherhood of Railway Carmen, No. 511	H. Gee	65 Essex Avenue	T. Elliott	67a Portland Street	3rd Monday in month.
United Brotherhood of Carpenters and Joiners, No. 941	A. Barker	Bertha Street, Swansea.	E. Webster	67 Wood Street	Alternate Mondays in month.
United Brotherhood of Carpenters and Joiners, No. 1820	W. Buchanan	624 Dupont Street ...	T. Jackson	34 Applegrove Avenue..	1st and 3rd Wednesdays in month.
United Brotherhood of Carpenters and Joiners, No. 2638	J. Thompson	22 Bayview Avenue ...	H. Day	6 Eglinton Avenue E...	2nd and 4th Mondays in month.
United Brotherhood of Carpenters and Joiners, No. 2640	D. Dickson	New Toronto P.O.	W. Buchanan	248 Concord Avenue....	Alternate Mondays in month.
United Brotherhood of Carpenters and Joiners, No. 2641	C. Baker	968 Shaw Street	G. Thomson	223 Lippincott St.....	2nd and 4th Thursdays in month.
United Brotherhood of Carpenters and Joiners, No. 2642	A. Lyon	96 John Street	W. Mills	56 Arundel Avenue	Alternate Mondays in month.
United Brotherhood of Carpenters and Joiners, No. 2643	J. Rankin	408 Bartlett Avenue ...	W. Burrow	28 Ivy Avenue	Alternate Fridays in month.
United Brotherhood of Carpenters and Joiners, No. 2644	J. Carruthers ...	17 Willow Avenue	T. Gazey	114 Chester Avenue....	1st and 3rd Tuesdays in month.
Cigarmakers' International Union, No. 27	J. McCarthy	118 Manning Avenue ..	J. Pamphilon	Room 106, 88 Church St.	3rd Monday in month.
Order of Railway Conductors, No. 345	S. Carson	243 Evelyn Avenue	E. Chapman	142 Medland Street	2nd and 4th Sundays in month.
Egg Inspectors' Federal Union, No. 14,578	A. Corre	94 Simpson Avenue	R. Ward	298 Bathurst Street ...	1st and 3rd Tuesdays in month.
International Brotherhood of Electrical Workers, No. 353.	E. Rodgers	20 Alexander Street ...	C. Kelly	47 Brookmount Road.	Every Wednesday in month.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President	President's Address	Name of Secretary	Secretary's Address	Nights of Meeting.
Toronto:—*Continued.*					
International Brotherhood of Electrical Workers, No. 586.	A. Farquhar	94 Chester Avenue	J. Bates	44 Summerhill Avenue..	Every Tuesday in month.
Amalgamated Society of Engineers, No. 816	W. Green	118 Edwin Avenue	J. Prain	103 Armstrong Avenue.	Every 2nd Friday in month.
Brotherhood of Locomotive Engineers, No. 70	W. Newcome	111 Melgund Road	H. Eastwood	170 Macdonnell Avenue.	2nd and 4th Sundays in month.
National Association of Marine Engineers, No. 1	C. Arnot	94 Huntley Street	W. Woods	468 Euclid Avenue	Every Friday from Dec. to March.
Canadian Association of Stationary Engineers, No. 1...	J. Tweedale	Lambton Club	J. Marr	301 Berkeley Street	2nd and 4th Wednesdays in month.
International Union of Steam Engineers, No. 356	R. Banks	9 Brooklyn Avenue	W. Buker	135 Montrose Avenue...	1st and 3rd Wednesdays in month.
International Union of Steam Engineers, No. 152	J. Jones	6 King Street W.	H. Scott	167 Church Street.....	2nd and 4th Wednesdays in month.
Brotherhood of Locomotive Firemen and Enginemen, No. 67	G. Crowhurst	90 Wolseley Street.....	J. Pratt	218 Fern Avenue	1st Thursday and 3rd Sunday in month.
Brotherhood of Locomotive Firemen and Enginemen, No. 596	W. Dixon	74 Malvern Street	H. Schaefer	36 Lyall Avenue	Call of President.
International Brotherhood of Stationary Firemen, No. 300.	J. Real	657 Wellington Street..	H. McCaffrey	272 Dupont Street.....	2nd and 4th Thursday in month.
Fur Workers' Union, No. 40.	B. Greenevsky ..	39 Baldwin Street	M. Greenbaum ..	109 Chestnut Street...	Every Thursday in month.
Garment Workers' International Union, No. 70	Mr. Lavitt	19 Bellevue Place	Miss B. Pimstone.	423 Sackville Street...	Every Wednesday in month.
Garment Workers' International Union, No. 83	W. Walley	95 Pears Avenue	W. Rose	101 Dundas Street.....	Every Monday in month.
Garment Workers' International Union, No. 92	A. Kirzner	291 Simcoe Street	A. Bunyan	5 Camden Street.....	Every Tuesday in month.
United Garment Workers' Union, No. 185	D. Hepton	469 St. Clarens Avenue.	W. Worden	11 McLean Avenue....	2nd and 4th Friday in month.
United Garment Workers' Union, No. 198	M. Lifshitz	123 St. Patrick Street..	M. Anen	56 Elizabeth Street....	Every Monday in month.
United Garment Workers' Union, No. 202	Mrs. Harrison ...	468½ Queen Street W..	Miss Schrier	152 Booth Avenue.....	2nd Monday in month.

Gilders' and Finishers' Union, No. 636	W. Stuart	118 Ann Street	W. Smith	11 Glendale Crescent, Mount Dennis	4th Friday in month.
International Glass Blowers' Association, No. 66	B. Johnson	38 Beaconsfield Avenue	H. Munn	164 Argyle Street	Last Saturday in month.
International Association of Glass Workers, No. 21	C. Lumsden	7 Queen Victoria Ave.	E. Swain	92 Jones Avenue	2nd Friday in month.
American Flint Glass Workers' Union, No. 45	R. Sibengood	897 Gerrard Street	F. Stoffel	5 West Avenue	Last Saturday in month.
International Association of Granite Cutters	G. Rae	119½ Marlborough Ave.	J. Smith	117½ Marborough Ave.	4th Wednesday in month.
Lathers' International Union, No. 97	A. Dearlove	77 Yarmouth Road	J. Booth	7 Monteith Street	Every Tuesday in month.
Lithographers' International Association, No. 12	A. Norman	136 Wallace Avenue	J. Christie	104 Palmerston Avenue	2nd and 4th Wednesday in month.
Longshoremen's International Association, No. 646	J. Dowling	117 Leslie Street	S. Stalford	2 Curzon Street	1st Sunday in month.
International Association of Machinists, No. 235	R. Armstrong	112 Coxwell Avenue	G. Crossman	273 Arthur Street	2nd and 4th Wednesday in month.
International Association of Marble Workers, No. 12	C. Fraser	254 Broadview Avenue.	E. Cooke	43 McPherson Avenue	1st and 3rd Thursday in month.
International Association of Marble Workers, No. 99	F. Chester	47 Wilton Avenue	T. Williams	139 Shuter Street	1st and 3rd Thursday in month.
International Association of Marble Workers, No. 100	A. Woods	3 Dean Street	T. Gough	177 Bleecker Street	1st and 3rd Friday in month.
International Moulders' Union, No. 28	J. Hill	515 Durie Street	R. Harris	110 Ossington Avenue.	1st and 3rd Wednesday in month.
International Brass Moulders' Union, No. 207	D. O'Brien	252 Simcoe Street	W. Jones	324 Bain Avenue	1st and 3rd Friday in month.
American Federation of Musicians, No. 149	J. Reid	132 Beatrice Street	J. Ball	Musicians' Temple, University Avenue	1st Sunday in month.
Brotherhood of Painters, Decorators and Paperhangers, No. 3	J. Marshall	431 Church Street	J. Stevenson	47 Curzon Street	2nd and 4th Thursday in month.
Brotherhood of Painters, Decorators and Paperhangers, No. 219	J. Yeats	32½ Bellwoods Avenue.	J. Hoffie	568 Parliament Street.	1st and 3rd Wednesday in month.
Brotherhood of Painters, Decorators and Paperhangers, No. 737	A. Murray	86 Palmerston Avenue.	W. Rimmer	810½ Queen Street E.	2nd and 4th Wednesday in month.
Brotherhood of Painters, Decorators and Paperhangers, No. 1059	L. Piltzmacher	Toronto	S. Basin	93 Baldwin Street	Every Tuesday in month.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President	President's Address.	Name of Secretary	Secretary's Address	Night of Meeting.
Toronto.—*Con.*					
Patternmakers' League of North America	P. Megginson	522 Gladstone Avenue	A. Hamilton	181 Macdonnell Avenue	2nd and 4th Monday in month.
Moving Picture Operators' Union, No. 173	C. McMahon	12 Ulster Street	G. Eaton	680 Ossington Avenue	1st Sunday in month.
International Photo-Engravers' Union, No. 35	E. Slean	6 Grace Street	N. Smith	184 Grange Avenue	1st Monday in month.
Operative Plasterers' International Association, No. 48	D. Webber	906 Manning Avenue	W. Hamilton	307 Salem Avenue	2nd and 4th Thursday in month.
Plasterers' Labourers' Union, No. 1	H. Tattersall	22 West Market Street	J. Fidler	Mount Dennis P.O.	1st and 3rd Tuesday in month.
United Association of Plumbers and Steamfitters, No. 46	F. Jenkins	263 Delaware Avenue	D. Rattray	766 Dovercourt Road	2nd and 4th Friday in month.
Metal Polishers', Buffers' and Platers' Inter. Union, No. 21	J. Webb	74 Palmerston Avenue	F. Vick	155 Symington Avenue	2nd and 4th Wednesday in month.
Printing Press Assistants' and Feeders' Inter. Union, No. 1	J. Burke	843 Dovercourt Road	J. Mason	2 Leonard Avenue	1st Monday in month.
Printing Press Assistants' and Feeders' Union (C.F.L.), No. 1	L. Cowle	467 Queen Street E.	F. Attrell	161 Wheeler Avenue	1st Thursday in month.
Printing Pressmen's Union (C.F.L.), No. 10	B. Hurd	122 Wheeler Avenue	C. Keates	280 Silverbirch Avenue	2nd Monday in month.
Web Pressmen's Union, No. 1	J. Campbell	135 Euclid Avenue	W. Hall	113½ Lansdowne Ave.	3rd Monday in month.
Amalgamated Sheet Metal Workers, International Association, No. 30	C. Turner	793 Gladstone Avenue	A. Murray	40 Hastings Avenue	1st and 3rd Friday in month.
International Association of Steam Fitters, No. 78	G. Milligan	Korman House	F. Black	1344 Queen Street W.	2nd and 4th Friday in month.
Stereotypers' and Electrotypers' Inter. Union, No. 21	H. Montgomery	300 Bathurst Street	P. Bowen	12 Hazelton Avenue	1st Thursday in month.
Amalgamated Association of Street and Electric Railway Employees, No. 113	J. Scott	136 Wright Avenue	W. Robbins	Room 4, Labour Temple	1st Monday and 3rd Sunday in month.
Tailors' Industrial International Union, No. 132	A. Wilson	465 Bathurst Street	J. Watt	167 Church Street	2nd and 4th Monday in month.
Tile and Slate Roofers' International Union, No. 39	J. Hall	108 Claremont Street	F. Richards	143 Seaton Street	1st and 3rd Monday in month.

Tile Layers' and Helpers' International Union, No. 37	J. Gray	67 Essex Avenue	A. Lowrie	1895 Davenport Road	1st and 3rd Friday in month.
Commercial Telegraphers' Union, No. 1	H. Lynch	Box 844, Winnipeg, M.	C. Hill	362 Brock Avenue	1st Sunday after 15th of month.
Brotherhood of Railway Trainmen, No. 322	W. Johnson	13 Windeat Street	W. Henderson	476 W. Marion Street	1st and 3rd Sunday in month.
Brotherhood of Railway Trainmen, No. 255	H. Huggins	23 Edna Avenue	J. Miller	224 Fairview Avenue	1st, 3rd and 5th Sunday in month.
Brotherhood of Railway Trainmen, No. 759	W. Burke	17 Roblock Street	F. King	606 Delaware Avenue	1st and 3rd Sunday in month.
Travellers' Goods and Leather Novelty Workers' International Union, No. 5	W. Duncan	195 Osler Avenue	J. Mathews	730 Richmond St. W.	2nd Wednesday in month.
International Typographical Union, No. 91	D. McDougall	117 Concord Avenue	S. Hadden	77 Victoria Street	1st Saturday in month.
Upholsterers' International Union, No. 30	A. Comisky	118 Bond Street	A. Clifford	747 Gladstone Avenue	1st and 3rd Tuesday in month.
Waiters' Union, No. 300	J. Darlow	250 Roxton Road	J. Noakes	1432 Bloor St. W.	Every Wednesday in month.
Trenton:					
Brotherhood of Locomotive Engineers, No. 837	J. Hawkins	Box 464, Trenton	W. Smith	Box 405, Trenton	2nd and 4th Sunday in month.
International Association of Machinists, No. 834	J. Jones	Division St., Trenton	G. Millard	Box 402, Trenton	2nd and 4th Wednesday in month.
Brotherhood of Railway Trainmen, No. 495	H. James	Trenton	Roy Snyder	Trenton P.O.	4th Friday in month.
Tweed:					
International Brotherhood of Maintenance of Ways Employees, No. 68	W. Wager	Marlbank	G. Gray	Actinolite	4th Friday in month.
International Brotherhood of Maintenance of Ways Employees, No. 192	G. Spooner	Smith's Falls	G. Francis	Tweed	Last Saturday in month.
Wallaceburg:					
Glass Bottle Blowers' International Association, No. 70	H. Greenwood	Wallaceburg	A. Tighe	Wallaceburg	Alternate Saturdays in month.
American Flint Glass Workers' Union, No. 70	J. Demars	Blake Street	C. Schaaf	Box 39, Wallaceburg	1st Sunday in month.
Welland:					
Bricklayers', Masons' and Plasterers' International Union, No. 32	W. Balding	Welland P.O.	G. Lipney	Welland P.O.	Every Wednesday in month.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Concluded.*

Name of Organization.	Name of President	President's Address	Name of Secretary	Secretary's Address	Nights of Meeting.
Welland.—*Continued.*					
United Brotherhood Carpenters and Joiners, No. 969..	Mr. Morrow	Welland	J. Dills	Welland	2nd and 4th Friday in month.
United Brotherhood Carpenters and Joiners, No. 2653.	W. Powrie	Orchard Grove	F. Edwards	71 John Street.....	2nd and 4th Monday in month.
International Association of Machinists, No. 131.....	E. Bunn	399 West Main Street..	W. Noble	108 Regent Street.....	1st and 3rd Monday in month.
United Association of Journeymen Plumbers, Steam Fitters and Helpers	G. Schran	254 North Main Street.	.....	.....	2nd and 4th Thursday in month.
Order of Railway Telegraphers, No. 16.....	J. Culkins	Albion, Mich.	J. Staley.....	Box 903, Welland.....	3rd Monday in month.
Windsor:					
Bricklayers', Masons' and Plasterers' International Union, No. 6.....	G. Hewitt	144 Bruce Avenue.....	A. Hall	159 Gladstone Ave....	Every Tuesday in month.
United Brotherhood Carpenters and Joiners, No. 494..	T. Bennett	30 Aylmer Avenue....	W. Holman	116 Gladstone Ave....	Every Wednesday in month.
Cigarmakers' International Union, No. 284.....	F. Terwilliger....	394 Baldwin Avenue, Detroit, Mich.	C. Milligan	62 Sandwich Street....	2nd and 4th Wednesday in month.
Order of Railway Conductors, No. 494	J. McNicholl	34 London Street.....	G. Brown	136 Windsor Avenue...	2nd and 4th Sunday in month.
Brotherhood of Locomotive Engineers, No. 390.....	J. McGarvah	73 Assumption Street..	G. Richardson ...	59 Aylmer Avenue.....	2nd and 4th Thursday in month.
National Association Marine Engineers, No. 11.....	A. McDonald	28 Crawford Avenue...	N. Maitland	221 London Street W.	.....
Brotherhood Locomotive Firemen and Enginemen, No. 421	J. Rigby	39 Parent Avenue.....	A. Butler	28 Glengarry Avenue..	1st Sunday and 3rd Tuesday in month.
Federated Association Letter Carriers, No. 16.....	C. Stricker	46 Crawford Avenue...	C. Stowe	16 Pelissier Street....	.....
Operative Plasterers' International Association, No. 345.	H. Crawford	Sandwich P.O.	J. Adams	Windsor P.O.	1st and 3rd Tuesday in month.
International Alliance Sheet Metal Workers, No. 320....	J. Parks	42 Arthur Street.....	M. Thomson	60 Chatham Street....	2nd and 4th Friday in month.

Brotherhood of Railway Trainmen, No. 316	E. White	73 Elizabeth Street W., Detroit ,Mich.	W. Cole	73 Argyle Road, Walkerville	1st and 3rd Wednesday and 2nd and 4th Sunday in month.
International Typographical Union, No. 553	W. Black	14 Elm Avenue	G. Marentette	17½ Assumption St.	1st Sunday in month.
Woodstock:					
Bricklayers', Masons' and Plasterers' International Union, No. 22	J. Hill	Box 382, Woodstock	F. Hames	25 Huron Street	2nd and 4th Tuesday in month.
United Brotherhood Carpenters and Joiners, No. 1471	A. Denny	Woodstock	O. Carter	681 Francis Street	1st and 3rd Tuesday in month.

WAGES AND HOURS OF LABOUR.

Table showing average wages per week and hour, and hours of labour, with comparison between those organized and unorganized in localities as reported; also number of days idle and periods of wage payment.

Location and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average days idle.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
ALLANDALE:	$ c.	$ c.	c.	c.								
Order of Railway Conductors, No. 355	30 00	30 00	36	36	varies	varies	varies	varies	varies	varies	varies	monthly
Bro. of Locomotive Firemen and Enginemen, No. 442	mileag	e basis	varies	varies	varies	varies	varies	varies	varies	varies	varies	monthly
Maintenance of Ways Employees, No. 200	10 20	10 20	17	17	50	50	10	10	60	60	none	monthly
Brotherhood of Railway Trainmen, No. 377	mileag	e basis	varies	varies	50	50	10	10	60	60	none	monthly
AMHERSTBURG:												
Int. Rock Drillers' Association, No. 20	23 40	23 40	39	39	50	50	10	10	60	60	100	fortnightly
Int. Bro. Steam Shovel and Dredgemen, No. 20	28 80	28 80	40	40	60	60	12	12	72	72	100	fortnightly
BEAVERTON:												
Maintenance of Ways Employees, No. 262	12 00	12 00	20	20	50	50	10	10	60	60	.....	monthly
BELLEVILLE:												
Journeymen Barbers' International Union, No. 723	12 00	12 00	19	19	50	50	13	13	63	63	none	weekly
Bricklayers, Masons and Plasterers Union, No. 30	24 30	18 90	45	35	45	45	9	9	54	54	140	week & fort.
Brotherhood of Locomotive Engineers, No. 189	35 00	35 00	mileag	e basis	50	50	10	10	60	60	15	monthly
Maintenance of Ways Employees, No. 83	9 90	9 90	16½	16½	50	50	10	10	60	60	none	monthly
Plumbers, Steam Fitters and Helpers, No. 220	14 25	14 25	26	26	45	45	9	9	54	54	45	weekly
BERLIN:												
Journeymen Barbers' International Union, No. 304	14 00	12 00	.....	.....	55	55	16	16	71	71	none	weekly
Boot and Shoe Workers' Union, No. 206	10 00	10 00	16⅔	16⅔	50	50	5	5	55	55	24	fortnightly
Int. Union of Brewery Workers, No. 170	14 00	14 00	27½	27½	45	45	6	6	51	51	none	week. & fort.
Bricklayers, Masons and Plasterers' Union, No. 12	23 00	19 80	48	33	40	50	8	10	48	60	150	fortnightly
United Bro. of Carpenters and Joiners, No. 553	22 00	16 50	40	30	50	50	5	5	55	55	30	fortnightly
Cigarmakers' International Union, No. 422	11 00	.....	25	.....	40	50	4	5	44	55	20	weekly
Int. Brotherhood of Electrical Workers, No. 535	13 50	.....	25	.....	45	.....	9	.....	54	.....	.....	fortnightly
Canadian Asso. of Stationary Engineers, No. 9	13 75	13 75	25	25	50	50	5	5	55	55	none	fortnightly
Federal Labour Union, No. 17	10 62	.....	18	.....	50	.....	9	.....	59	.....	125	fortnightly

Hodcarriers and Building Labourers' Union, No. 160	16 80	16 80	35	35	40	40	8	8	48	48	75	fortnightly
Federated Association of Letter Carriers, No. 20	15 00	15 00	31¼	31¼	40	40	8	8	48	48	none	fortnightly
American Federation of Musicians, No. 226	16 00	.....	50	.....	.....	.....	.....	.....	.....	.....	.....	fortnightly
Upholsterers' International Union, No. 42	16 50	13 00	28	22	50	50	9	9	59	59	none	fortnightly
BLENHEIM:												
Maintenance of Ways Employees, No. 502	10 50	10 50	17½	17½	50	50	10	10	60	60	none	monthly
BRANTFORD:												
Journeymen Barbers' International Union, No. 298	13 00	.....	22½	.....	45	.....	13	.....	58	.....	none	weekly
Bartenders' International League, No. 182	15 00	.....	27	.....	45	.....	10	.....	55	.....	.....	wk. or month
Bricklayers, Masons and Plasterers' Union, No. 9	22 00	18 90	50	35	40	45	4	9	44	54	90	weekly
United Bro. of Carpenters and Joiners, No. 498	17 50	15 00	35	30	45	45	5	5	50	50	90	weekly
Int. Brotherhood of Electrical Workers, No. 443	17 11	17 11	29	29	50	50	9	9	59	59	10	week & fort.
Canadian Asso. of Stationary Engineers, No. 4	12 00	12 00	21¾	21¾	50	50	5	5	55	55	none	week & fort.
International Moulders' Union, No. 29	18 00	18 00	32¾	32¾	50	50	5	5	55	55	150	fortnightly
Operative Plasterers' International Union, No. 164	19 80	.....	45	.....	40	50	4	5	44	55	90	weekly
Journeymen Stonecutters' Asso. of North America	22 00	all me.	50	.....	40	.....	4	.....	44	.....	90	weekly
International Typographical Union, No. 378	17 00	.....	35	.....	42½	50	5½	5	48	55	none	weekly
BRIDGEBURG:												
Brotherhood of Railway Carmen, No. 542	15 00	.....	25	.....	50	.....	10	.....	60	.....	none	monthly
United Bro. of Carpenters and Joiners, No. 1850	21 60	.....	40	.....	45	.....	9	.....	54	.....	.....	weekly
Brotherhood of Locomotive Engineers, No. 679	32 76	32 76	45½	45½	60	60	12	12	72	72	12	monthly
Brotherhood of Railway Trainmen, No. 713	26 60	26 60	37	37	60	60	12	12	72	72	none	monthly
BROCKVILLE:												
Order of Railway Conductors, No. 366	20 00	20 00	.....	.....	.....	.....	.....	.....	.....	.....	none	monthly
Brotherhood of Locomotive Engineers, No. 118	mileag	e basis	mileag	e basis	mileag	e basis	mileag	e basis	mileag	e basis	none	monthly
Journeymen Tailors' International Union, No. 262	12 00	.....	22	.....	45	.....	9	.....	54	.....	30	weekly
Brotherhood of Railway Trainmen, No. 208	20 00	20 00	mil'ge	basis	50	50	10	10	60	60	30	monthly
BURLINGTON:												
United Bro. of Carpenters and Joiners, No. 2603	18 25	15 00	35	25	50	50	5	10	55	60	100	fortnightly
CARLETON PLACE:												
Int. Bro. of Blacksmiths and Helpers, No. 424	11 00	11 00	22	22	45	45	5	5	50	50	12	monthly
Brotherhood of Railway Carmen, No. 229	14 00	.....	28	.....	45	.....	5	.....	50	.....	32	monthly
International Association of Machinists, No. 211	17 50	17 50	35	35	45	45	5	5	50	50	13	fortnightly
Maintenance of Ways Employees, No. 222	10 20	10 20	17	17	50	50	10	10	60	60	none	monthly
International Moulders' Union, No. 362	18 00	18 00	.....	.....	50	.....	5	.....	55	.....	70	fortnightly
Metal Polishers, Buffers and Brass Workers, No. 96	19 80	all org	33	.....	50	.....	10	.....	60	.....	.....	fortnightly
Stove Mounters International Union, No. 78	15 00	15 00	25	25	50	50	10	10	60	60	.....	fortnightly
CHAPLEAU:												
Brotherhood of Railway Carmen, No. 378	13 50	all org	25	.....	45	.....	9	.....	54	.....	none	monthly
Brotherhood of Locomotive Engineers, No. 319	40 00	40 00	50	50	varies		varies		varies		.....	monthly
Bro. of Locomotive Firemen and Enginemen, No. 321	15 00	15 00	20	20	"	"	"	"	"	"	.....	monthly
International Association of Machinists, No. 535	25 00	25 00	45½	45½	50	50	5	5	55	55	none	monthly
CHATHAM:												
United Bro. of Carpenters and Joiners, No. 1583	17 70	11 80	30	20	50	50	9	9	59	59	90	weekly
United Garment Workers of America, No. 44	.....	.....	.....	.....	42½	42½	4½	4½	47	47	30	weekly

Table showing average wages and hours of labour, etc.—*Continued.*

Location and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average days idle.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
	$ c.	$ c.	c.	c.								
American Federation of Musicians, No. 629	15 00	7 00	.....	.....	25	25	5	5	30	30	none	weekly
International Typographical Union, No. 421	13 50	13 50	28	28	40	40	8	8	48	48	none	weekly
COBALT:												
United Bro. of Carpenters and Joiners, No. 894	15 00	15 00	.....	.....	45	45	9	9	54	54	.....	monthly
Int. Steam and Operating Engineers, No. 531	18 00	.....	30	.....	.....	.....	.....	.....	.....	.....	.....	monthly
Western Federation of Miners, No. 146	16 50	16 50	.....	.....	40	40	8	8	48	48	45	monthly
Order of Railway Telegraphers, No. 99	varies		varies		50	50	10	10	60	60	none	monthly
COLLINGWOOD:												
Journeymen Barbers' International Union, No. 528	11 00	.....	.....	.....	50	.....	15	.....	65	.....	.....	weekly
Bricklayers, Masons and Plasterers' Union, No. 19	21 68	17 28	42	32	45	45	9	9	54	54	180	weekly
Amalgamated Society of Engineers, No. 805	16 22	16 22	27½	27½	50	50	9	9	59	59	none	fortnightly
National Association of Marine Engineers, No. 3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90	monthly
International Association of Machinists, No. 627	16 22	16 22	27½	27½	50	50	9	9	59	59	.....	fortnightly
CORDOVA:												
Western Federation of Miners, No. 147	10 50	10 50	17½	17½	50	50	10	10	60	60	60	monthly
DUNDAS:												
Moulders' International Union, No. 269	17 87	all org	32½	.....	50	.....	5	.....	55	.....	.....	fortnightly
ELK LAKE:												
Western Federation of Miners, No. 140	15 84	15 84	33	33	40	40	8	8	48	48	100	monthly
ENGLEHART:												
Maintenance of Ways Employees, No 3	13 30	13 30	19	19	60	60	10	10	70	70	.....	monthly
FORT WILLIAM:												
Journeymen Barbers' International Union, No. 549	18 00	18 00	.....	.....	52½	52½	13½	13½	66	66	none	weekly
Bartenders' International League, No. 761	20 00	.....	39	.....	45	.....	6	.....	51	.....	.....	monthly
Int. Bro. of Boilermakers and Helpers, No. 505	22 25	16 50	44½	27½	45	50	5	10	50	60	40	monthly
Bricklayers, Masons and Plasterers' Union, No. 25	35 10	35 10	65	65	45	45	9	9	54	54	140	fortnightly
Int. Asso. Bridge and Structural Iron Workers, No. 53	30 50	15 00	56¼	25	45	50	9	10	54	60	.....	fortnightly
United Bro. of Carpenters and Joiners, No. 2610	.....	.....	.....	.....	50	.....	10	.....	60	.....	.....	fortnightly
Order of Railway Conductors, No. 286	30 00	30 00	45	45	mileage basis			mileage basis			.....	monthly

Int. Dredge Workers Protective Association, No. 9	15 54	15 54	17	17	80	80	12	12	92	92	90	monthly
Int. Steam Shovel and Dredgemen's Union, No. 9	17 80	17 80	25	25	60	60	12	12	72	72	100	monthly
Int. Steam Shovel and Dredgemen's Union, No. 39	25 00	.....	50	.....	42½	.....	7½	.....	50	.....	120	monthly
Int. Steam and Operating Engineers, No. 298	27 00	21 00	45	35	50	50	10	10	60	60	60	fortnightly
Bro. of Locomotive Firemen and Enginemen, No. 225	18 00	18 00	mile	age ba sis			mile	age ba sis			.....	monthly
Journeymen Horseshoers' Int. Union, No. 282	19 25	19 25	35	35	50	50	5	5	55	55	none	weekly
Int. Longshoremen's Asso. (Coal Handlers), No. 746	15 00	15 00	25	25	50	50	10	10	60	60	.....	monthly
Int. Longshoremen's Asso. (Grain Trimmers), No. 479	25 00	25 00	40	40	.....	.....	.....	.....	.....	.....	120	weekly
International Association of Machinists, No. 309	.....	.....	45½	30½	40	40	.....	.....	40	40	.....	monthly
Maintenance of Ways Employees, No. 128	12 30	12 30	29½	20½	50	50	10	10	60	60	.....	monthly
Maintenance of Ways Employees, No. 277	13 80	13 80	23	23	50	50	10	10	60	60	60	monthly
International Moulders' Union, No. 429	18 00	.....	30	.....	50	.....	10	.....	60	.....	65	fortnightly
Operative Plasterers' Int. Union, No. 344	32 40	32 40	60	60	45	45	9	9	54	54	125	fortnightly
United Asso. of Plumbers and Steam Fitters, No. 257	27 23	27 23	55	55	45	45	4½	4½	49½	49½	60	fortnightly
Switchmen's Union of North America, No. 195	24 42	24 42	37	37	55	55	11	11	66	66	none	monthly
Brotherhood of Railway Trainmen, No. 306	40 00	40 00	mile	age ba sis			mile	age ba sis			none	monthly
International Typographical Union, No. 417	23 04	23 04	48	48	40	40	8	8	48	48	none	weekly
GALT:												
Journeymen Barbers' International Union, No. 413	13 86	.....	22	.....	50	.....	13	.....	63	.....	none	weekly
Bricklayers, Masons and Plasterers' Union, No. 15	21 60	16 20	45	30	40	45	8	9	48	54	125	weekly
Federated Association of Letter Carriers, No. 39	15 00	15 00	27¾	27¾	45	45	9	9	54	54	none	fortnightly
International Moulders' Union, No. 447	16 50	14 70	30	27	50	50	5	5	55	55	30	fortnightly
American Federation of Musicians, No 124	21 00	.....	50	.....	35	.....	7	.....	42	.....	.....	weekly
Painters, Decorators and Paperhangers, No 906	16 25	16 25	27½	27½	50	50	9	9	59	59	.....	weekly
GANANOQUE:												
International Union of Paving Cutters	18 00	.....	37½	.....	40	.....	8	.....	48	.....	90	fortnightly
GUELPH:												
Journeymen Barbers' International Union, No. 310	12 50	.....	.....	.....	43	.....	12	.....	55	.....	.....	weekly
Bartenders' International League, No. 104	16 80	12 80	24	18	60	60	10	10	70	70	none	weekly
Bricklayers, Masons and Plasterers' Union, No. 3	24 00	all org	50	.....	40	.....	8	.....	48	.....	100	week. fort.
Federated Association of Letter Carriers, No. 18	16 50	all org	.....	.....	40	.....	8	.....	48	.....	none	fortnightly
Moulders' International Union, No. 212	19 18	16 23	32½	27½	50	50	9	9	59	59	none	weekly
American Federation of Musicians, No. 92	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Piano and Organ Workers' Union, No. 34	12 38	..	22½	.....	50	.....	5	.....	55	.....	40	fortnightly
Journeymen Tailors' Union of America, No. 297	12 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	weekly
HAMILTON:												
Journeymen Barbers' International Union, No. 131	16 00	.....	.....	.....	50	.....	13	.....	63	.....	.....	weekly
Bartenders' International League, No. 197	20 00	15 00	.....	.....	45	45	9	9	54	54	90	weekly
Int. Brotherhood of Bookbinders, No. 114	15 00	15 00	34⅛	34⅛	40	40	4	4	44	44	20	weekly
Boot and Shoe Workers' Union, No. 228	piece	work	.....		50	all org	5	.....	55	.....	none	weekly
Boot and Shoe Workers' Union, No. 232	16 00	all org	29	.....	50	.....	5	.....	55	.....	14	weekly
Boot and Shoe Workers' Union, No. 234	piece	work	.....	.....	45	45	9	9	54	54	.....	weekly
Boot and Shoe Workers' Union, No. 444	12 10	all org	22	.....	50	.....	5	.....	55	.....	none	weekly
United Brewery Workers' Int. Union, No. 312	14 00	14 00	28	28	45	45	5	5	50	50	25	weekly
Bricklayers, Masons and Plasterers' Union, No. 1	24 20	.....	55	.....	40	.....	4	.....	44	.....	.....	weekly

Table showing average wages and hours of labour, etc.—*Continued.*

Location and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average days idle.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
HAMILTON—Continued.	$ c.	$ c.	c.	c.								
Broom and Whisk Makers' Int. Union, No. 9	16 00	.....	32½	.....	45	.....	4	.....	49	.....	none	weekly
Builders' Labourers' Union, No. 1	15 40	.....	35	.....	40	.....	4	.....	44	.....	100	weekly
United Bro. of Carpenters and Joiners, No. 18	17 60	13 20	40	30	40	40	4	4	44	44	50	fortnightly
United Bro. of Carpenters and Joiners, No. 2612	17 60	13 20	40	30	40	40	4	4	44	44	60	fortnightly
United Bro. of Carpenters and Joiners, No. 2659	17 60	.....	40	.....	40	.....	4	.....	44	.....	.....	fortnightly
American Brotherhood of Cement Workers, No. 170	19 25	.....	45	.....	40	.....	5	.....	45	.....	86	weekly
Cigarmakers' International Union, No. 55	13 00	all org	.....	.....	40	.....	4	.....	44	.....	none	weekly
Order of Railway Conductors, No. 27	25 00	25 00	mile	age ba	sis		mile	age ba	sis		none	monthly
International Bro. Electrical Workers, No. 390	16 20	14 85	30	27	49	50	5	5	54	55	none	weekly
Brotherhood of Locomotive Engineers, No. 133	32 00	32 00	mile	age ba	sis		mile	age ba	sis		.....	monthly
Canadian Asso. of Stationary Engineers, No. 2	15 00	15 00	25	25	50	50	10	10	60	60	none	weekly
United Garment Workers' Union, No. 219	16 00	16 00	piece	work	44½	44½	4½	4½	49	49	25	weekly
United Garment Workers' Union, No. 256	14 70	14 70	30	30	45	45	4	4	49	49	50	weekly
Amal. Glass Workers' Int. Association, No. 33	15 00	all org	30	.....	45	.....	5	.....	50	.....	none	weekly
International Granite Cutters Association	16 50	13 20	37½	30	40	40	4	4	44	44	none	fortnightly
Int. Journeymen Horseshoers, No. 72	16 50	15 50	30	27	50	50	5	5	55	55	14	weekly
Federal Labour Union, No. 11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	fortnightly
Int. Wood, Wire and Metal Lathers, No. 145	19 80	.....	45	.....	40	.....	4	.....	44	.....	.....	weekly
International Association of Machinists, No. 414	18 00	.....	32½	.....	50	.....	5	.....	55	.....	.....	weekly
International Moulders' Union, No. 26	19 50	pc.wk.	32½	pc.wk.	50	50	10	10	60	60	.....	week. & fort.
American Federation of Musicians, No. 293	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Painters, Decorators and Paperhangers, No. 205	17 50	12 50	35	25	45	45	5	5	50	50	90	weekly
Moving Picture Operators' Protective Union, No. 303	14 40	.....	30	.....	40	.....	8	.....	48	.....	.....	weekly
Operative Plasterers' International Union, No. 298	23 10	.....	52½	.....	40	.....	4	.....	44	.....	100	fortnightly
United Asso. of Plumbers and Gas Fitters, No. 67	18 70	.....	42½	.....	40	.....	4	.....	44	.....	50	weekly
Int. Printing Pressmen and Assistants, No. 176	18 00	12 00	37½	25	43½	43½	4½	4½	48	48	none	weekly
Int. Metal Polishers and Buffers, No. 26	15 00	15 00	27½	27½	50	50	5	5	55	55	none	weekly
Sheet Metal Workers' Int. Alliance, No. 61	18 75	13 75	37½	27½	45	45	5	5	50	50	none	weekly
Journeymen Stone Cutters of North America	22 00	.....	50	.....	40	.....	4	.....	44	.....	80	fortnightly
Stove Mounters' International Union, No. 35	11 00	.....	25	.....	40	.....	4	.....	44	.....	.....	weekly

Amal. Asso. S. and E. R. Employees, No. 107	12 15	12 15	22½	22½	45	45	9	9	54	54	52	fortnightly
Stereotypers and Electrotypers' Union, No. 113	18 86	.....	41	.....	40	.....	6	.....	46	.....	none	weekly
Tailors' Industrial International Union, No. 149	14 00	14 00	piece	work	50	50	10	10	60	60	100	weekly
Order of Railway Telegraphers, No. 155	20 00	20 00	33⅓	33⅓	50	50	10	10	60	60	none	monthly
Int. Alliance of Theatrical Stage Employees, No. 129	15 00	15 00	37½	37½	34	34	6	6	40	40	.....	weekly
International Tobacco Workers' Union, No. 48	piece	work	piece	work	50	50	5	5	55	55	60	weekly
Brotherhood of Railway Trainmen, No. 226	18 00	18 00	35	35	mile	age ba	sis		mile	age ba	sis	..... monthly
HAVELOCK:												
Order of Railway Conductors, No. 578	35 00	35 00	mile	age ba	sis		mile	age ba	sis		none	monthly
Brotherhood of Locomotive Engineers, No. 658	35 00	35 00	mile	age ba	sis		mile	age ba	sis		.....	monthly
Brotherhood of Railway Trainmen, No. 293	22 00	22 00	mile	age ba	sis		mile	age ba	sis		none	monthly
HERON BAY:												
Maintenance of Ways Employees, No. 231	11 40	6 90	19	11½	50	50	10	10	60	60	60	monthly
INGERSOLL:												
Maintenance of Ways Employees, No. 503	14 40	14 40	24	24	50	50	10	10	60	60	none	monthly
KENORA:												
Brotherhood of Railway Carmen, No. 236	11 68	11 68	26½	26½	40	40	4	4	44	44	65	monthly
Order of Railway Conductors, No. 352	.....	.....	milage	basis	.....	.....	.....	.....	.....	.....	varies	monthly
Brotherhood of Locomotive Engineers, No. 535	50 00	50 00	milage	basis	.....	.....	.....	.....	.....	.....	.....	monthly
International Association of Machinists, No. 28	24 57	24 57	45½	45½	45	45	9	9	54	54	none	monthly
Order of Railway Telegraphers, No. 7	28 00	28 00	.....	.....	49½	49½	9½	9½	59	59	none	monthly
Brotherhood of Railway Trainmen, No. 270	.....	.....	milge	basis	.....	.....	.....	.....	.....	.....	.....	monthly
KINGSTON:												
Journeymen Barbers' International Union, No. 514	14 00	11 00	.....	.....	50	50	13	13	63	63	none	weekly
Bricklayers, Masons and Plasterers' Union, No. 10	24 00	14 40	50	50	40	40	8	8	48	48	100	fortnightly
United Bro. of Carpenters and Joiners, No. 249	18 00	12 00	37½	22½	40	45	8	9	48	54	30	fortnightly
National Asso. of Marine Engineers, No. 4	20 00	20 00	37	37	45	45	9	9	54	54	.....	monthly
International Building Labourers' Union, No. 66	13 44	12 00	28	25	40	40	8	8	48	48	140	fortnightly
Federated Association of Letter Carriers, No. 8	15 00	15 00	27¾	27¾	45	45	9	9	54	54	none	fortnightly
Amalgamated Sheet Metal Workers' Union, No. 117	18 00	16 50	37½	27½	40	50	8	10	48	60	none	weekly
International Moulders' Union, No. 252	18 00	.....	36	.....	45	.....	5	.....	50	.....	30	weekly
Painters, Decorators and Paperhangers Union, No. 114	18 00	.....	37½	.....	40	.....	8	.....	48	.....	.....	weekly
United Asso. of Plumbers and Steam Fitters, No. 221	18 00	all org	37½	.....	40	.....	8	.....	48	.....	55	weekly
Journeymen Stone Cutters Association of America	24 00	24 00	50	50	40	40	8	8	48	48	120	fortnightly
Journeymen Tailors' Int. Union, No. 263	12 00	12 00	.....	.....	45	45	9	9	54	54	60	weekly
KINGSVILLE:												
Tobacco Workers' International Union, No. 71	8 75	all org	.....	.....	50	.....	5	.....	55	.....	.....	weekly
LEAMINGTON:												
United Bro. of Carpenters and Joiners, No. 2613	17 70	17 70	30	30	50	50	9	9	59	59	.....	weekly
Maintenance of Ways Employees, No. 302	10 20	10 20	17	17	50	50	10	10	60	60	none	monthly
LINDSAY:												
Order of Railway Conductors, No. 322	25 00	25 00	milage	basis	60	60	12	12	72	72	30	monthly
Bro. of Locomotive Firemen and Enginemen, No. 136	20 00	20 00	milage	basis	50	50	10	10	60	60	.....	monthly
Brotherhood of Locomotive Engineers, No. 174	30 00	.....	milage	basis	.....	.....	.....	.....	.....	.....	.....	monthly
Brotherhood of Railway Trainmen, No. 308	15 00	15 00	25	25	50	50	10	10	60	60	.....	monthly

Table showing average wages and hours of labour, etc.—*Continued.*

Location and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average days idle.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
LONDON:	$ c.	$ c.	c.	c.								
Bartenders' International League, No. 137	15 00	.....	.....	.....	36	.....	6	.....	42	.....	.....	weekly
Int. Alliance Billposters and Billers, No. 22	12 00	.....	22½	.....	45	.....	9	.....	54	.....	none	weekly
Int. Brotherhood of Bookbinders, No. 206	14 00	14 00	27	27	47½	47½	4½	4½	52	52	none	weekly
Brewery Workers' Union, No. 381	10 87	.....	20	.....	47½	.....	6	.....	53½	.....	none	weekly
Bricklayers, Masons and Plasterers' Union, No. 5	22 00	19 80	50	45	40	40	4	4	44	44	115	weekly
United Bro. of Carpenters and Joiners, No. 1946	19 80	17 32	40	35	45	45	4½	4½	49½	49½	.....	weekly
Cigarmakers' International Union, No. 278	11 00	.....	25	.....	40	.....	4	.....	44	.....	60	weekly
Order of Railway Conductors, No. 16	30 00	30 00	milage	basis	55	55	11	11	66	66	none	monthly
International Bro. of Electrical Workers, No. 120	16 50	.....	33⅓	.....	45	.....	4	.....	49	.....	.....	weekly
Brotherhood of Locomotive Engineers, No. 68	30 00	30 00	milage	basis	.....	.....	.....	.....	.....	.....	.....	monthly
Brotherhood of Locomotive Engineers, No. 528	30 00	30 00	milage	basis	.....	.....	.....	.....	.....	.....	.....	monthly
Amalgamated Society of Engineers, No. 809	15 00	12 00	25	20	50	50	10	10	60	60	none	weekly
Canadian Asso. of Stationary Engineers, No. 30	16 50	16 50	30	30	50	50	5	5	55	55	none	weekly
Bro. of Locomotive Firemen and Enginemen, No. 117	.....	.....	milage	basis	50	50	10	10	60	60	60	monthly
Bro. of Locomotive Firemen and Enginemen, No. 468	25 00	.....	milage	basis	.....	.....	.....	.....	.....	.....	.....	monthly
Federated Asso. of Letter Carriers, No. 4	15 00	.....	.....	.....	45	.....	9	.....	54	.....	none	fortnightly
Int. Association of Machinists, No. 383	20 00	.....	33⅓	.....	50	.....	10	.....	60	.....	none	monthly
Maintenance of Ways Employees, No. 195	12 00	12 00	20	20	50	50	10	10	60	60	60	monthly
Maintenance of Ways Employees, No. 497	10 62	10 62	18	18	50	50	9	9	59	59	none	monthly
American Federation of Musicians, No. 279	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Metal Polishers, Buffers and Brass Workers, No. 32	19 25	15 00	35	27¼	50	50	5	5	55	55	75	fortnightly
Printing Pressmen and Assistants' Int. Union, No. 173	18 00	15 00	37	25	44	50	4	10	48	60	none	weekly
Journeymen Stonecutters Association of America	22 00	all org	50	.....	40	.....	4	.....	4	.....	90	weekly
Order of Railway Telegraphers, No. 1	15 00	15 00	22¾	22¾	55	55	11	11	66	66	none	monthly
Int. Alliance of Theatrical Stage Employees, No. 105	13 50	13 50	25	25	.....	.....	.....	.....	.....	.....	90	weekly
Brotherhood of Railway Trainmen, No. 240	16 00	16 00	milage	basis	.....	.....	.....	.....	.....	.....	.....	monthly
Brotherhood of Railway Trainmen, No. 415	.....	.....	milage	basis	.....	.....	.....	.....	.....	.....	.....	monthly
International Typographical Union, No. 133	16 80	15 00	37	27¾	40	45	8	9	48	54	none	weekly
MIDLAND:												
Int. Longshoremen's Association, No. 199	piece	work	piece	work	piece	work	.....	.....	.....	.....	.....	.....

MILVERTON:												
Maintenance of Ways Employees, No. 163	14 40	14 40	24	24¾	50	50	10	10	60	60	none	monthly
MIMICO:												
Bro. of Locomotive Firemen and Enginemen, No. 756	16 50	16 50	25	25	55	55	11	11	66	66	.....	monthly
MUSKOKA:												
Maintenance of Ways Employees, No. 217	10 20	10 20	17	17	50	50	10	10	60	60	none	monthly
NIAGARA FALLS:												
Bricklayers, Masons and Plasterers' Union, No. 27	30 00	.....	¼ 62½	.....	40	.....	8	.....	48	.....	150	weekly
United Bro. of Carpenters and Joiners, No. 2624	17 60	15 40	40	35	40	40	4	4	44	44	30	weekly
Bro. of Locomotive Firemen and Enginemen, No. 487	19 14	19 14	29	29	55	55	11	11	66	66	21	monthly
Federated Asso. of Letter Carriers, No. 36	14 85	.....	27½	.....	45	.....	9	.....	54	.....	none	fortnightly
Brotherhood of Railway Trainmen, No. 379	22 20	22 20	37	37	50	50	10	10	60	60	15	monthly
NORTH BAY:												
Int. Brotherhood of Blacksmiths, No. 474	15 50	15 50	31	31	45	45	5	5	50	50	none	monthly
Boilermakers and Iron Ship Builders' Union, No. 417	18 48	.....	42	.....	40	.....	4	.....	44	.....	.....	monthly
United Bro. of Carpenters and Joiners, No. 2625	15 95	11 60	27½	20	50	50	8	8	58	58	50	weekly &fort
Brotherhood of Railway Carmen, No. 192	12 50	12 50	25	25	45	45	5	5	50	50	none	monthly
Bro. of Locomotive Firemen and Enginemen, No. 791	milge	basis	.....	.....	.....	.....	.....	.....	.....	.....	.....	monthly
Order of Railway Conductors, No. 242	35 00	35 00	milge	basis	.....	.....	.....	.....	.....	.....	.....	monthly
International Association of Machinists, No. 413	18 00	.....	36	.....	45	.....	5	.....	50	.....	.....	monthly
Maintenance of Ways Employees, No. 244	10 50	10 50	17½	17½	50	50	10	10	60	60	none	monthly
Brotherhood of Railway Trainmen, No. 249	25 00	25 00	milge	basis	.....	.....	.....	.....	.....	.....	.....	monthly
ORANGEVILLE:												
Maintenance of Ways Employees, No. 214	10 20	10 20	17	17	50	50	10	10	60	60	none	monthly
ORILLIA:												
Bricklayers, Masons and Plasterers' Union, No. 18	24 30	.....	45	.....	45	.....	9	.....	54	.....	120	weekly
OSHAWA:												
Bricklayers, Masons and Plasterers' Union, No. 20	.....	.....	.....	.....	50	.....	9	.....	59	.....	.....	weekly
International Moulders' Union, No. 136	14 75	14 75	25	25	50	50	9	9	59	59	20	weekly
OTTAWA:												
Bricklayers, Masons and Plasterers' Union, No. 7	24 20	18 70	55	45	40	40	4	4	44	44	146	fortnightly
Bricklayers, Masons and Plasterers' Union, No. 14	24 20	18 70	55	45	40	40	4	4	44	44	.....	fortnightly
Int. Brotherhood of Bookbinders, No. 173	18 00	.....	37½	.....	44	.....	4	.....	44	.....	none	weekly
United Bro. of Carpenters and Joiners, No. 93	20 00	.....	40	.....	45	.....	5	.....	50	.....	50	fortnightly
Brotherhood of Railway Carmen, No. 230	12 25	12 25	24½	24½	45	45	5	5	50	50	none	monthly
Order of Railway Conductors, No. 29	35 00	35 00	milge	basis	.....	.....	.....	.....	.....	.....	.....	monthly
Amalgamated Society of Engineers, No. 885	18 00	.....	33⅓	.....	45	.....	9	.....	54	.....	none	weekly
Brotherhood of Locomotive Engineers, No. 168	35 00	35 00	milage	basis	.....	.....	.....	.....	.....	.....	.....	monthly
Brotherhood of Locomotive Engineers, No. 469	40 00	40 00	milge	basis	.....	.....	.....	.....	.....	.....	.....	monthly
Canadian Asso. of Stationary Engineers, No. 473	16 20	12 77	23½	18½	60	60	9	9	69	69	58	weekly &fort
Int. Steam and Operating Engineers, No. 473	18 00	.....	36	.....	45	.....	5	.....	50	.....	none	weekly
Bro. of Locomotive Firemen and Enginemen, No. 81	milge	basis	.....	.....	.....	.....	.....	.....	.....	.....	.....	monthly
Bro. of Locomotive Firemen and Enginemen, No. 172	30 00	30 00	milge	basis	.....	.....	.....	.....	.....	.....	75	monthly
Federal Labour Union, No. 15	17 82	.....	33	.....	45	.....	9	.....	54	.....	.....	fortnightly
Federal Labour Union, No. 20	.....	.....	.....	.....	40	.....	8	.....	48	.....	.....	weekly

Table showing average wages and hours of labour, etc.—*Continued.*

Location and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average days idle.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
OTTAWA.—Continued.	$ c.	$ c.	c.	c.								
American Flint Glass Workers Union, No. 104	17 05	17 05	31	31	50	50	5	5	55	55	30	weekly
International Association of Machinists, No. 412	16 67	16 67	33½	33½	45	45	5	5	50	50	none	weekly
International Association of Machinists, No. 825	15 40	.....	28	.....	50	.....	5	.....	55	.....	none	weekly
Maintenance of Ways Employees, No. 223	10 20	10 20	17	17	50	50	10	10	60	60	none	monthly
International Moulders' Union, No. 280	18 00	.....	33⅓	.....	45	.....	9	.....	54	.....	.....	fortnightly
American Federation of Musicians, No. 180	18 00	.....	.....	.....	25	.....	5	.....	30	.....	.....	fortnightly
Painters, Decorators and Paperhangers' Union, No. 200	18 50	13 50	37	27	45	45	5	5	50	50	25	weekly & fort
International Brotherhood of Papermakers, No. 34	16 80	16 80	35	35	40	40	8	8	48	48	none	fortnightly
Int. Plasterers' Labourers' Union, No. 1	15 00	12 50	30	25	45	45	5	5	50	50	75	fortnightly
United Asso. Plumbers and Steam Fitters, No. 71	19 80	15 40	45	35	40	40	4	4	44	44	30	weekly & fort
Printing Pressmen's International Union, No. 5	20 16	.....	42	.....	43	.....	5	.....	48	.....	none	weekly
Int. Steel and Copper Plate Printers, No. 6	.....	.....	.....	.....	42½	.....	4½	.....	47	.....	.....	weekly
Journeymen Stonecutters Asso. of North America	24 20	.....	55	.....	40	.....	4	.....	44	.....	80	fortnightly
Amal. Asso. Street and Electric Railway Em., No. 279	15 00	15 00	25	25	50	50	10	10	60	60	none	fortnightly
Journeymen Tailors' Union of America, No. 143	12 96	.....	24	.....	45	.....	9	.....	54	.....	50	weekly
Brotherhood of Railway Trainmen, No. 129	25 00	25 00	milage	basis	.....	.....	.....	.....	.....	.....	none	monthly
Brotherhood of Railway Trainmen, No. 185	.....	.....	milage	basis	.....	.....	.....	.....	.....	.....	.....	monthly
Canadian Typographical Union, No. 1	20 88	20 88	43½	43½	43	43	5	5	48	48	.....	fortnightly
International Typographical Union, No. 102	21 12	21 12	44	44	43	43	5	5	48	48	none	weekly & fort
OWEN SOUND:												
Bricklayers, Masons and Plasterers' Union, No. 11	22 00	22 00	50	50	45	45	9	9	54	54	150	fortnightly
Canadian Asso. of Stationary Engineers, No. 25	15 00	15 00	25	25	50	50	10	10	60	60	96	fortnightly
International Moulders' Union, No. 413	15 00	.....	.....	.....	41¼	.....	8¾	.....	50	.....	.....	fortnightly
Journeymen Stonecutters' Asso. of N. America	24 00	.....	50	.....	40	.....	8	.....	48	.....	.....	fortnightly
PALMERSTON:												
Order of Railway Conductors, No. 492	26 00	26 00	mileage basis		.....	.....	.....	.....	.....	.....	.....	monthly
Bro. of Locomotive Firemen and Enginemen, No. 181	15 00	15 00	24	24	mileage basis		.....	.....	.....	.....	none	monthly
Brotherhood of Locomotive Engineers, No. 518	25 00	25 00	40	40	mileage basis		.....	.....	.....	.....	none	monthly
Brotherhood of Railway Trainmen, No. 39	18 00	18 00	30	30	50	50	10	10	60	60	50	monthly

PARRY SOUND:												
Brotherhood of Railway Carmen, No. 157	10 20	10 20	17	17	50	50	10	10	60	60	61	monthly
Brotherhood of Locomotive Engineers, No. 728	mileage basis				.....	.....	.....	.....	.....	.....	.....	monthly
International Association of Machinists, No. 518	19 47	19 47	33	33	50	50	9	9	59	59	none	monthly
PETERBOROUGH:												
Bartenders' International League, No. 293	13 00	.....	.....	.....	50	.....	11	.....	61	.....	.....	weekly
Bricklayers, Masons and Plasterers' Union, No. 17	24 00	.....	50	.....	40	.....	8	.....	48	.....	.....	weekly
Int. Brotherhood of Electrical Workers, No. 261	9 63	9 63	17½	17½	50	50	5	5	55	55	40	
Federated Asso. of Letter Carriers, No. 22	15 35	.....	.....	.....	.....	.....	.....	.....	.....	.....	none	fortnightly
Maintenance of Ways Employees, No. 211	10 80	10 80	18	18	50	50	10	10	60	60	none	monthly
International Moulders' Union, No. 191	17 00	.....	31¾	.....	45	.....	9	.....	54	.....	.....	weekly & fort
Amal. Asso. Street and Electric Railway Em., No. 622	11 00	.....	19	.....	varies		.....	.....	.....	.....	.....	monthly
Journeymen Tailors' Union of America No. 23	15 00	15 00	25	25	50	50	10	10	60	60	60	weekly
International Typographical Union, No. 248	17 00	.....	.....	.....	40	.....	8	.....	48	.....	none	weekly
PORCUPINE:												
Western Federation of Miners, No. 145	16 20	less	30	less	45	.....	9	.....	54	.....	120	monthly
PORT ARTHUR:												
Brotherhood of Railway Carmen, No. 347	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	monthly
United Bro. of Carpenters and Joiners, No. 285	27 50	22 00	50	40	50	50	5	5	55	55	60	fortnightly
United Bro. of Carpenters and Joiners, No. 2629	25 00	.....	50	.....	45	.....	5	.....	50	.....	100	fortnightly
Brotherhood of Railway Conductors, No. 536	35 00	35 00	mileage basis		.....	.....	.....	.....	.....	.....	none	monthly
International Bro. of Electrical Workers, No. 367	20 00	20 00	40	40	45	45	5	5	50	50	.....	fortnightly
Canadian Asso. of Stationary Engineers, No. 29	21 00	21 00	35	35	50	50	10	10	60	60	40	monthly
Bro. of Locomotive Firemen and Enginemen, No. 593	17 82	17 82	33	33	45	45	9	9	54	54	150	monthly
Brotherhood of Locomotive Engineers, No. 631	35 00	35 00	50	50	varies		varies		varies		.....	monthly
Int. Association of Marine Engineers, No. 16	30 00	30 00	.....	.....	60	60	12	12	72	72	60	monthly
Int. Longshoremen's Asso. (Coal Handlers), No. 319	15 00	15 00	30	30	varies		varies		varies		.....	monthly
International Association of Machinists, No. 820	19 25	19 25	35	35	50	50	5	5	55	55	.....	monthly
American Federation of Musicians, No. 489	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
United Asso. of Journeymen Plumbers, No. 378	26 95	less	55	less	45	.....	4	.....	49	.....	75	fortnightly
Journeymen Stonecutters' Asso. of North America	26 40	.....	60	.....	40	.....	4	.....	44	.....	125	fortnightly
International Typographical Union, No. 575	23 00	all org	48	.....	40	.....	8	.....	48	.....	.....	fortnightly
PORT COLBORNE:												
United Bro. of Carpenters and Joiners, No. 1168	18 90	13 50	45	25	45	45	9	9	54	54	.....	fortnightly
PORT DOVER:												
Longshoremen's Int. Asso. (Fishermen), No. 21	13 20	13 20	20	20	55	55	11	11	66	66	90	fortnightly
PORT HOPE:												
International Moulders' Union, No. 189	18 00	less	30	less	50	50	10	10	60	60	45	fortnightly
PRESTON:												
United Bro. of Carpenters and Joiners, No. 931	19 25	13 75	35	25	50	50	5	5	55	55	38	weekly
Int. Metal Polishers and Buffers' Union, No. 27	.....	.....	.....	.....	40	.....	none	.....	40	.....	.....	weekly
Stove Mounters' Int. Union, No. 11	13 75	.....	25	.....	50	.....	5	.....	55	.....	80	weekly
RAINY RIVER:												
Brotherhood of Railway Carmen, No. 436	13 00	13 00	26	26	45	45	5	5	50	50	50	monthly
Order of Railway Conductors, No. 30	36 00	36 00	varies		50	50	10	10	60	60	.....	monthly

Table showing average wages and hours of labour, etc.—*Continued.*

Location and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average days idle.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
	$ c.	$ c.	c.	c.								
Brotherhood of Locomotive Engineers, No. 749	25 00	25 00	mileage basis		.....	.....	.....	.....	.....	.....	.....	monthly
Bro. of Locomotive Firemen and Enginemen, No. 750	25 00	.....	mileage basis		.....	.....	.....	.....	.....	.....	.....	monthly
Brotherhood of Railway Trainmen, No. 828	25 00	25 00	varies		50	50	10	10	60	60	75	monthly
RAMSAY STATION:												
Maintenance of Ways Employees, No. 237	11 40	.....	19	.....	50	.....	10	.....	60	.....	.....	monthly
REDDITT:												
Brotherhood of Railway Carmen, No. 549	16 80	16 80	28	28	50	50	10	10	60	60	none	monthly
RIDGEWAY:												
United Bro. of Carpenters and Joiners, No. 1950	18 00	18 00	30	30	50	50	10	10	60	60	75	weekly
ST. CATHARINES:												
Journeymen Barbers' International Union, No. 1	12 00	.....	.....	.....	60	.....	12	.....	72	.....	.....	weekly
International Brewery Workmen, No. 305	12 00	all org	.....	.....	45	.....	9	.....	54	.....	none	weekly
Bricklayers, Masons and Plasterers' Union, No. 4	26 25	less	52½	less	45	.....	5	.....	50	.....	150	weekly
United Bro. of Carpenters and Joiners, No. 38	15 25	12 00	30½	20	45	50	5	10	50	60	30	weekly
United Bro. of Carpenters and Joiners, No. 2632	21 50	.....	43	.....	45	.....	5	.....	50	.....	21	weekly
Cigarmakers' International Union, No. 140	14 16	.....	29⅓	.....	40	.....	8	.....	48	.....	none	weekly
International Bro. of Electrical Workers, No. 303	18 26	all org	38	.....	40	.....	8	.....	48	.....	none	weekly
Federated Asso. of Letter Carriers, No. 17	15 00	.....	varies	.....	40	.....	8	.....	48	.....	none	fortnightly
Int. Association of Machinists, No. 268	17 88	12 10	32½	22	50	50	5	5	55	55	none	fortnightly
International Moulders' Union, No. 385	19 18	19 18	32½	32½	50	50	9	9	59	59	.....	fortnightly
Painters, Decorators and Paperhangers, No. 407	17 50	less	35	less	45	45	5	5	50	50	40	weekly
Tailors' Int. Industrial Union, No. 235	12 00	12 00	20	20	50	50	10	10	60	60	60	weekly
International Typographical Union No. 416	17 10	all org	35½	.....	42	.....	6	.....	48	.....	none	weekly
ST. MARY'S:												
Journeymen Stonecutters' Asso. of North America	19 60	all org	45	.....	40	.....	8	.....	48	.....	75	weekly
ST. THOMAS:												
Canadian Blacksmiths and Helpers No. 94	17 82	.....	33	.....	45	.....	9	.....	54	.....	.....	monthly
Boilermakers and Helpers of America No. 413	18 60	18 60	34½	34½	45	45	9	9	54	54	none	monthly
Bricklayers, Masons and Plasterers' Union, No. 8	27 00	less	50	less	45	.....	9	.....	54	.....	60	fortnightly

United Bro. of Carpenters and Joiners, No. 1798	16 50	less	30	less	50	.....	5	.....	55	.....	90	weekly
Cigarmakers' International Union, No. 420	18 00	all org	40	.....	40	.....	5	.....	45	.....	75	weekly
Order of Railway Conductors, No. 13	33 00	33 00	35	35	varies			varies			.....	monthly
Brotherhood of Locomotive Engineers, No. 132	30 00	.....		mile	age basis			mile	age basis		.....	monthly
Brotherhood of Locomotive Engineers, No. 529	30 00	30 00	39	39	varies			varies			.....	monthly
Brotherhood of Locomotive Engineers, No. 661		mile	age basis				mile	age basis			.....	monthly
Amalgamated Society of Engineers, No. 813	17 75	.....	35½	.....	45	.....	5	.....	50	.....	.....	fortnightly
Bro. of Locomotive Firemen and Enginemen, No. 5	25 00	25 00	mileage basis		50	50	10	10	60	60	.....	monthly
Federated Asso. of Letter Carriers, No. 23	17 00	17 00	35½	35½	40	40	8	8	48	48	none	fortnightly
International Association of Machinists, No. 294	19 17	less	35½	less	45	.....	9	.....	54	.....	22	fortnightly
Brotherhood of Railway Signalmen, No. 27	13 20	13 20	22	22	50	50	10	10	60	60	none	fortnightly
Journeymen Tailors' Union of America, No. 141	12 00	less		varies				varies			60	.....
Brotherhood of Railway Trainmen, No. 47		mile	age basis				mile	age basis			.....	fortnightly
SARNIA:												
Brotherhood of Locomotive Engineers, No. 240	30 00	30 00	45	45	varies			varies			none	monthly
International Longshoremen's Association, No. 253	18 00	15 00	30	25	50	50	10	10	60	60	120	.....
SAULT STE. MARIE:												
Bricklayers Masons and Plasterers' Union, No. 16	24 75	less	55	less	45	.....	9	.....	54	.....	90	fortnightly
Order of Railway Conductors, No. 429	25 00		mile	age basis			mile	age basis			none	monthly
Federated Asso. of Letter Carriers, No. 42	14 85	14 85	27½	27½	45	45	9	9	54	54	none	weekly
Brotherhood of Locomotive Engineers, No. 67	25 00	25 00	mile	age basis			mile	age basis			.....	monthly
Bro. of Locomotive Firemen and Enginemen, No. 606	30 00	30 00		mileage	basis			mileage	basis		.....	monthly
International Association of Machinists, No. 485	19 50	19 50	32½	32½	50	50	10	10	60	60	none	monthly
Maintenance of Ways Employees, No. 491	14 70	14 70	24½	24½	50	50	10	10	60	60	none	monthly
International Moulders' Union, No. 391	21 00	21 00	35	35	50	50	10	10	60	60	none	monthly
Int. Brotherhood of Papermakers, No. 133	18 92	18 92	39⅕	39⅕	40	40	8	8	48	48	none	monthly
United Asso. of Plumbers etc., No. 414	24 84	24 84	46	46	45	45	9	9	54	54	60	weekly
Brotherhood of Railway Trainmen, No. 611	21 00	21 00	35	35	50	50	10	10	60	60	.....	monthly
SCHREIBER:												
Order of Railway Conductors, No. 573		mile	age basis			mils	age basis				none	monthly
Brotherhood of Locomotive Engineers, No. 562	37 10	37 10	53	53	60	60	10	10	70	70	none	monthly
Bro. of Locomotive Firemen and Enginemen, No. 387	20 00	.....	mile	age basis			mile	age basis			.....	monthly
Int. Association of Machinists, No. 69	24 60	24 60	41	41	50	50	10	10	60	60	none	monthly
Int. Asso. of Machinists (Helpers), No. 927	10 56	.....	24	.....	40	.....	4	.....	44	.....	.....	monthly
Brotherhood of Railway Trainmen, No. 419	25 00	25 00	30	30	varies			varies			.....	monthly
SILVER CENTRE:												
Western Federation of Miners, No. 148	18 00	18 00	37½	37½	40	40	8	8	48	48	none	monthly
SIMCOE:												
United Bro. of Carpenters and Joiners, No. 2634	18 00	18 00	30	30	50	50	10	10	60	60	.....	weekly
SMITH'S FALLS:												
Bricklayers, Masons and Plasterers' Union, No. 21	24 30	24 30	45	45	45	45	9	9	54	54	120	fortnightly
United Bro. of Carpenters and Joiners, No. 1047	19 18	16 20	32½	30	50	50	9	9	59	59	.....	fortnightly
Brotherhood of Locomotive Engineers, No. 381	35 00	all org	42	.....	varies			varies			30	monthly
Bro. of Locomotive Firemen and Enginemen, No. 381		mile	age basis				mile	age basis			.....	monthly
Maintenance of Ways Employees, No. 136	10 20	10 20	17	17	50	50	10	10	60	60	none	monthly

Table showing average wages and hours of labour, etc.—*Continued.*

Location and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average days idle.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
SMITH'S FALLS.—*Continued.*	$ c.	$ c.	c.	c.								
International Moulders' Union, No. 201	21 95	less	38½	less	47½	.....	9½	.....	57	.....	40	fortnightly
Brotherhood of Railway Trainmen, No. 527	24 50	24 50	mile	age ba	sis		mile	age ba	sis		none	monthly
STRATFORD:												
Bro. of Boilermakers and Helpers, No. 3	11 25	11 25	25	25	40	40	5	5	45	45	none	monthly
Bricklayers, Masons and Plasterers' Union, No. 24	27 00	18 00	50	30	45	50	9	10	54	60	150	wkly & fort.
United Bro. of Carpenters and Joiners, No. 1238	20 65	17 70	35	30	50	50	9	9	59	59	30	fortnightly
Cigarmakers' International Union, No. 424	14 00	all org	29⅙	.....	40	.....	8	.....	48	.....	none	weekly
Order of Railway Conductors No. 15	.....	.....	mileag	e basis	.....	.....	.....	.....	.....	.....	.....	monthly
Amalgamated Society of Engineers, No. 597	15 40	.....	28	.....	50	.....	5	.....	55	.....	none	monthly
Brotherhood of Locomotive Engineers, No. 188	.....	.....	mileag	e basis	.....	.....	.....	.....	.....	.....	.....	monthly
Bro. of Locomotive Firemen and Enginemen, No. 38	.....	.....	mileag	e basis	.....	.....	.....	.....	.....	.....	.....	monthly
Painters, Decorators and Paperhangers, No. 746	13 57	less	23	less	50	.....	9	.....	59	.....	.....	week. &fort.
International Typographical Union, No. 139	15 00	less	31¼	less	40	.....	8	.....	48	.....	none	weekly
SUDBURY:												
Bartenders' International League, No. 237	16 27	11 68	35	25	40	40	6½	6½	46½	46½	none	monthly
Bricklayers, Masons and Plasterers' Union, No. 31	29 70	.....	55	.....	45	.....	9	.....	54	.....	180	fortnightly
Maintenance of Ways Employees, No. 40	14 70	14 70	24½	24½	50	50	10	10	60	60	130	monthly
THOROLD:												
Int. Bro. of Steam Shovel and Dredgemen, No. 55	37 50	.....	62½	.....	50	.....	10	.....	60	.....	80	monthly
Int. Brotherhood of Papermakers, No. 101	17 28	less	36	less	40	.....	8	.....	48	.....	none	weekly
TORONTO:												
Asbestos Workers' International Union, No. 20	12 00	less	25	less	40	.....	8	.....	48	.....	120	weekly
Bakers and Confectioners Canadian Union, No. 90	12 00	12 00	varies	varies	50	50	12	12	62	62	none	weekly
Int. Bread Wagon Drivers' Union, No. 181	15 00	all org	37½	.....	40	.....	.....	.....	40	.....	none	weekly
Journeymen Barbers' International Union, No. 517	12 00	9 00	varies	varies	46	46	13½	13½	59½	59½	none	weekly
Bartenders' International League, No. 280	19 72	less	34	less	50	.....	8	.....	58	.....	.....	weekly
National Boilermakers and Helpers' Union, No. 1	.....	.....	.....	.....	45	.....	5	.....	50	.....	15	week. & fort.
Int. Boilermakers and Helpers' Union, No. 548	16 50	13 50	33	27	45	45	5	5	50	50	none	monthly
Int. Brotherhood of Bookbinders' Union, No. 28	18 00	18 00	37½	37½	43¾	43¾	4¼	4¼	48	48	none	weekly
Canadian National Bookbinders' Union, No. 1	18 00	18 00	37½	37½	43¾	43¾	4¼	4¼	48	48	.....	weekly

Boot and Shoe Workers' Union, No. 233	14 70	11 75	30	24	45	45	4	4	49	49	25	weekly
Brass, Bronze and Wire Workers' Union, No. 139	13 75	13 75	25	25	50	50	5	5	55	55	none	week. & fort.
International Brewery Workers' Union, No. 304	15 50	all org	31	.....	45	.....	5	.....	50	.....	none	weekly
International Brewery Workers' Union, No. 317	14 00	14 00	23½	23½	50	50	10	10	60	60	150	weekly
Bricklayers, Masons and Plasterers' Union, No. 2	24 20	less	55	less	40	.....	4	.....	44	.....	100	fortnightly
Bricklayers, Masons and Plasterers' Union, No. 26	24 20	less	55	less	40	.....	4	.....	44	.....	100	fortnightly
Bridge and Structural Iron Workers' Int. Union, No. 4	19 80	15 40	45	35	40	40	4	4	44	44	90	fortnightly
Builders' Labourers' Union, No. 1	13 20	12 32	30	28	40	40	4	4	44	44	90	fortnightly
Brotherhood of Railway Carmen, No. 258	15 00	15 00	30	30	45	45	5	5	50	50	75	monthly
Brotherhood of Railway Carmen, No. 511	13 80	13 80	23	23	50	50	10	10	60	60	25	monthly
United Bro. of Carpenters and Joiners, No. 941	19 80	15 40	45	35	40	40	4	4	44	44	60	fortnightly
United Bro. of Carpenters and Joiners, No. 1820	17 50	less	35	less	45	.....	5	.....	50	.....	60	weekly
United Bro. of Carpenters and Joiners, No. 2638	18 48	16 28	42	37	40	40	4	4	44	44	30	fortnightly
United Bro. of Carpenters and Joiners, No. 2640	19 80	15 40	45	35	40	40	4	4	44	44	35	fortnightly
United Bro. of Carpenters and Joiners, No. 2641	19 80	15 40	45	35	40	40	4	4	44	44	30	fortnightly
United Bro. of Carpenters and Joiners, No. 2642	19 80	15 40	45	35	40	40	4	4	44	44	25	week.& fort.
United Bro. of Carpenters and Joiners, No. 2643	19 80	.....	45	.....	40	.....	4	.....	44	.....	84	fortnightly
United Bro. of Carpenters and Joiners, No. 2644	19 80	.....	45	.....	40	.....	4	.....	44	.....	.....	fortnightly
Cigarmakers' International Union, No. 27	12 00	all org	.....	.....	40	.....	4	.....	44	.....	30	weekly
Order of Railway Conductors, No. 345	30 00	30 00	.....	.....	mileage basis		.....	.....	.....	.....	none	monthly
Egg Inspectors' Federal Union, No. 14,578	12 00	12 00	20	20	50	50	10	10	60	60	none	weekly
International Bro. of Electrical Workers, No. 353	15 00	.....	30	.....	45	.....	5	.....	50	.....	52	week. &fort.
International Bro. of Electrical Workers, No. 586	17 60	.....	40	.....	40	.....	4	.....	44	.....	.....	week. & fort.
Amalgamated Society of Engineers, No. 816	17 50	.....	35	.....	45	.....	5	.....	50	.....	.....	fortnightly
Brotherhood of Locomotive Engineers, No. 70	.....	.....	mileage basis		.....	.....	.....	.....	.....	.....	.....	monthly
National Asso. of Marine Engineers, No. 1	varies	varies	varies	varies	varies	varies	varies	varies	varies	varies	100	monthly
Canadian Asso. of Stationary Engineers, No. 1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Internation Union of Steam Engineers, No. 356	24 00	less	40	less	50	.....	10	.....	60	.....	.....	fortnightly
International Union of Steam Engineers, No. 152	15 40	.....	35	.....	40	.....	4	.....	44	.....	.....	weekly
Bro. of Locomotive Firemen and Enginemen, No. 67	.....	.....	mileage basis		.....	.....	.....	.....	.....	.....	.....	monthly
Bro. of Locomotive Firemen and Enginemen, No. 596	20 00	.....	mileage basis		.....	.....	.....	.....	.....	.....	.....	monthly
Int. Bro. of Stationary Firemen, No. 300	13 75	.....	25	.....	50	.....	5	.....	55	.....	none	weekly
Fur Workers' Union, No. 40	11 60	less	20	less	54	.....	4	.....	58	.....	30	weekly
Garment Workers' International Union, No. 70	varies	varies	varies	varies	45	.....	4	.....	49	.....	75	weekly
Garment Workers' International Union No. 83	13 72	.....	28	.....	45	.....	4	.....	49	.....	36	weekly
Garment Workers' International Union, No. 92	13 72	.....	28	.....	45	.....	4	.....	49	.....	150	weekly
United Garment Workers' Union, No. 185	12 00	9 00	24½	18⅓	45	45	4	4	49	49	100	weekly
United Garment Workers' Union, No. 198	12 00	.....	24½	.....	45	.....	4	.....	49	.....	.....	weekly
United Garment Workers' Union, No. 202	12 00	.....	24½	.....	45	.....	4	.....	49	.....	none	weekly
Gilders and Finishers Union, No. 636	14 00	14 00	28	28	45	45	5	5	50	50	.....	week. & fort.
Int. Glass Blowers' Association, No. 66	piece	work	piece	work	42½	.....	7	.....	49½	.....	.....	fortnightly
Int. Association of Glass Workers, No. 21	16 00	16 00	32	32	45	45	5	5	50	50	.....	weekly
American Flint Glass Workers' Union, No. 45	piece	work	piece	work	45	47½	4½	4½	49½	42	.....	weekly
International Asso. of Granite Cutters	19 36	.....	44	.....	40	.....	4	.....	44	.....	30	fortnightly
Lathers' International Union, No. 97	22 00	22 00	50	50	40	40	4	4	44	44	.....	week. & fort

Table showing average wages and hours of labour, etc.—*Continued.*

Locality and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average idle days.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
TORONTO.—*Continued.*	$ c.	$ c.	c.	c.								
Lithographers' Int. Association, No. 12	18 00	18 00	37½	37½	43¾	43¾	4⅛	4⅛	48	48	25	weekly
Longshoremen's Int. Association, No. 646	varies	varies	varies	varies	varies	varies	varies	varies	varies	varies	180	weekly
Int. Association of Machinists, No. 235	14 85	less	27	less	50	.....	5	.....	55	.....	.....	week. & fort.
Int. Association of Marble Workers, No. 12	12 50	less	25	less	45	.....	5	.....	50	.....	none	week. & fort.
Int. Association of Marble Workers, No. 99	27 52	14 52	62½	33	40	40	4	4	44	44	60	weekly
Int. Association of Marble Workers No. 100	15 40	11 00	35	25	40	40	4	4	44	44	.....	week. & fort.
International Moulders' Union No. 28	19 00	12 00	38	20	45	50	5	10	50	60	.....	week. & fort.
International Brass Moulders' Union, No. 207	16 50	less	33	less	45	.....	5	.....	50	.....	none	week. & fort.
American Federation of Musicians, No. 149	20 00	less	varies		varies		varies		varies		.....	weekly
Painters, Decorators and Paperhangers, No. 3	15 40	8 80	35	20	40	40	4	4	44	44	.....	fortnightly
Painters, Decorators and Paperhangers, No. 219	15 40	8 80	35	20	40	40	4	4	44	44	70	weekly
Painters, Decorators and Paperhangers, No. 737	15 40	less	35	less	40	.....	4	.....	44	.....	75	fortnightly
Painters, Decorators and Paperhangers, No. 1059	15 40	less	35	less	40	.....	4	.....	44	.....	60	weekly
Patternmakers' League of North America	20 79	17 82	42	36	45	45	4½	4½	49½	49½	.....	fortnightly
Moving Picture Operators' Union, No. 173	19 92	12 00	41½	25	40	40	8	8	48	48	.....	weekly
Int. Photo-Engravers' Union, No. 35	18 60	less	40	less	42½	.....	4	.....	46½	.....	none	weekly
Int. Asso. of Operative Plasterers, No. 48	23 10	18 70	52½	42½	40	40	4	4	44	44	75	fortnightly
Plasterers' Labourers' Union, No. 1	13 20	.....	30	.....	40	.....	4	.....	44	.....	60	fortnightly
United Asso. of Plumbers and Steam Fitters, No. 46	19 80	15 40	45	35	40	40	4	4	44	44	.....	fortnightly
Metal Polishers and Buffers Int. Union, No. 21	17 40	13 00	35	26	45	45	4½	4½	49½	49½	75	week. & fort.
Printing Press A. and F. Int. Union, No. 1	13 20	13 20	27½	27½	43¾	43¾	4¼	4¼	48	48	.....	weekly
Printing Press A. and F. Canadian Union, No. 1	13 35	.....	30⅜	.....	39¾	.....	4¼	.....	44	.....	none	weekly
Canadian Printing Pressmen's Union, No. 10	19 16	19 16	42	42	43¾	43¾	4¼	4¼	48	48	none	weekly
Webb Pressmen's Union, No. 1	20 00	all org	41¾	.....	40	.....	4	.....	48	.....	none	weekly
Amal. Sheet Metal Workers' Int. Asso., No. 30	16 50	15 00	37½	25	40	50	4	10	44	60	none	weekly
Int. Association of Steam Fitters, No. 78	19 80	15 40	45	35	40	40	4	4	44	44	30	week. & fort.
Stereotypers and Electrotypers' Int. Union, No. 21	20 00	20 00	41⅔	41⅔	40	40	8	8	48	48	none	weekly
Amal. Asso. Street and Electric Railway Em., No. 113	15 30	15 30	25½	25½	50	50	10	10	60	60	none	fortnightly

Tailors' Industrial Int. Union, No. 132	piece work		peice work		45	.....	9	.....	45	.....	.....	week. & fort.
Tile and Slate Roofers' Int. Union, No. 39	19 80	less	45	less	40	.....	4	.....	44	.....	72	week. & fort.
Tile Layers and Helpers' Int. Union, No. 37	22 00	.....	50	.....	40	.....	4	.....	48	.....	75	week. & fort.
Commercial Telegraphers' Union, No. 1	25 00	less	46⅔	less	45	.....	9	.....	54	.....	.....	monthly
Brotherhood of Railway Trainmen, No. 322	23 80	23 80	34	34	60	60	10	10	70	70	.....	monthly
Brotherhood of Railway Trainmen, No. 255	20 00	20 00	25	25	varies		varies		varies		.....	monthly
Brotherhood of Railway Trainmen, No. 759	18 00	18 00	mileage basis		.....	.....	.....	.....	.....	.....	.....	monthly
Travellers' Goods and Novelty Workers' Union, No. 5	13 87	8 91	26	18	45	45	4½	4½	49½	49½	15	fortnightly
International Typographical Union, No. 91	18 50	less	28	less	44	.....	4	.....	48	.....	10	weekly
Upholsterers' International Union, No. 30	17 60	less	40	less	40	.....	4	.....	44	.....	20	weekly
Waiters' Union, No. 300	6 00	less	varies		60	.....	12	.....	72	.....	100	fortnightly
TRENTON:												
Brotherhood of Locomotive Engineers, No. 837	25 00	25 00	mileage basis		.....	.....	.....	.....	.....	.....	.....	monthly
Int. Association of Machinists, No. 834	18 15	15 13	33	27½	50	50	5	5	55	55	none	monthly
Brotherhood of Railway Trainmen, No. 495	10 33	.....	17½	.....	50	.....	9	.....	59	.....	36	monthly
TWEED:												
Maintenance of Ways Employees, No. 68	9 90	9 90	16½	16½	50	50	10	10	60	60	none	monthly
Maintenance of Ways Employees, No. 192	10 20	10 20	17	17	50	50	10	10	60	60	none	monthly
WALLACEBURG:												
Glass Bottle Blowers' Int. Association, No. 70	30 00	30 00	56¼	56¼	45	45	8	8	53	53	60	fortnightly
American Flint Glass Workers' Union, No. 70	24 20	all org	55	.....	40	.....	4	.....	44	.....	90	weekly
WELLAND:												
Bricklayers, Masons and Plasterers' Union, No. 32	28 35	28 35	52½	52½	45	45	9	9	54	54	.....	weekly
United Bro. of Carpenters and Joiners, No. 969	20 00	15 00	40	25	45	50	5	10	50	60	90	weekly
United Bro. of Carpenters and Joiners, No. 2653	20 00	15 00	40	25	45	50	5	10	50	60	42	fortnightly
Int. Association of Machinists, No. 131	16 50	16 50	30	30	50	50	5	5	55	55	none	weekly
United Association of Plumbers, etc.	20 00	.....	40	.....	45	.....	5	.....	50	.....	none	weekly
Order of Railway Telegraphers, No. 16	17 16	17 16	26	26	55	55	11	11	66	66	none	fortnightly
WINDSOR:												
Bricklayers, Masons and Plasterers' Union, No. 6	27 42	27 42	62½	62½	40	40	4	4	44	44	.....	weekly
United Bro. of Carpenters and Joiners, No. 494	21 60	21 60	40	40	45	45	9	9	54	54	60	weekly
Cigarmakers' International Union, No. 284	17 60	all org	40	.....	40	.....	4	.....	44	.....	40	weekly
Order of Railway Conductors, No. 494	30 00	30 00	mileage basis				.....	.....	.....	.....	none	monthly
Brotherhood of Locomotive Engineers, No. 390	27 08	27 08	39	39	60	60	12	12	72	72	.....	monthly
National Association of Marine Engineers, No. 11	month 95 00	month 95 00	varies		60	60	12	12	72	72	60	monthly
Bro. of Locomotive Firemen and Enginemen, No. 421	18 00	18 00	25	25	60	60	12	12	72	72	none	monthly
Federated Asso. of Letter Carriers, No. 16	13 44	13 44	28	28	40	40	8	8	48	48	none	fortnightly
Operative Plasterers' Int. Association, No. 345	27 00	less	60	less	45	.....	5	.....	50	.....	60	fortnightly
Int. Alliance Sheet Metal Workers, No. 320	17 48	17 48	42	42	40	40	4	4	44	44	25	weekly
Brotherhood of Railway Trainmen, No. 316	35 00	35 00	mileage basis		.....	.....	.....	.....	.....	.....	none	monthly
International Typographical Union, No. 553	18 00	16 00	varies		40	40	4½	4½	44½	44½	none	weekly
WOODSTOCK:												
Bricklayers, Masons and Plasterers' Union, No. 22	27 00	.....	50	.....	45	.....	9	.....	54	.....	150	fortnightly
United Bro. of Carpenters and Joiners, No. 1471	17 70	11 80	30	20	50	50	9	9	59	59	75	weekly

DIRECTORY OF CENTRAL LABOUR ORGANIZATIONS IN ONTARIO.

Name of Organization.	Date Organized.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
BERLIN:				
Twin City Trades and Labour Council	1900	Urban Strub	Weber Apartments, Yonge Street	2nd & 4th Monds.
BRANTFORD:				
Trades and Labour Council	1886	H. J. Symons	115 Cayuga Street	1st & 2nd Weds.
BROCKVILLE:				
Trades and Labour Council	1900	Fred Clow	King St. W.	Every Friday.
FORT WILLIAM:				
Trades and Labour Council	1907	S. P. Speed	510 N. Brodie St.	2nd & 4th Weds.
GALT:				
Galt and Preston Trades and Labour Council		A. L. Philp	53 Centre St.	
GUELPH:				
Trades and Labour Council	1898	Thos. Hall	140 Bridge St.	2nd & 4th Frids.
HAMILTON:				
Trades and Labour Council	1888	W. R. Rollo	P. O. Box 323	1st & 3rd Frids.
Building Trades Council		Alex. Bonner	35 Steven St.	2nd & 4th Tues.
Garment Workers' District Council	1898	C. Bambrick	421 John St. North	2nd Wednesday.
KINGSTON:				
Trades and Labour Council		W. H. Godwin	14 Nelson St.	
LONDON:				
Trades and Labour Council	1902	Jack Lawlon	8 Sycamore St.	1st & 3rd Weds.
OTTAWA:				
Allied Trades and Labour Association	1897	Wm. Lodge	21 Creighton St.	1st & 3rd Thurs.
National Trades and Labour Council	1907	J. O'Heare	39 Cambridge St.	1st & 3rd Thurs.
Building Trades Council		Jos. Cinqmars	13 Poplar St.	
Allied Printing Trades Council		W. C. Blount	375 Lyon St.	
PETERBOROUGH:				
Trades and Labour Council		W. H. Stevens	Box 928	
PORT ARTHUR:				
Trades and Labour Council		A. F. Manchee	110 Jean St.	
SAULT STE. MARIE:				
Trades and Labour Council		R. S. Logan	349 North St., Steelton	
SOUTH WATERLOO:				
Trades and Labour Council		A. Craigen	24 East St., Galt	
ST. CATHARINES:				
Trades and Labour Council		Leo. T. Coyle	138 Church St.	1st & 3rd Weds.
ST. THOMAS:				
Trades and Labour Council		A. R. Robertson	92 Curtis St.	
TORONTO:	1881			
Toronto District Labour Council		T. A. Stevenson	24 Hazelwood Ave.	1st & 3rd Thurs.
Allied Printing Trades Council	1905	Harry Perkins	3 Spruce Court	2nd Tuesday.
Building Trades League		W. Varley	100 Doel Ave.	2nd & 4th Monds.

DIRECTORY OF CENTRAL LABOUR ORGANIZATIONS IN ONTARIO —*Continued.*

Name of Organization.	Date Organized.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
TORONTO.—*Con.*				
Marble Workers' Conference Board		Thomas Gough	177 Bleecker St.	
United Brotherhood Carpenters and Joiners District Council		Geo. Thomson	223 Lippincott St.	2nd & 4th Monds.
Managing Committee Amalgamated Society Carpenters and Joiners		Geo. Thomson	223 Lippincott St.	Alternate Weds.
Painters' District Council		T. Andrews	34 Duchess St.	4th Friday.
Garment Workers' Council.		H. A. Keller	59 Grange Ave.	
Theatrical Council		W. D. Shank	49 Edwin Ave.	
Metal Trades Council		F. King	416 Westmoreland	2nd & 4th Tues.
Iron Moulders' Board of Conference		J. H. Barnett	19 Rolyat St.	
Label Trades Department		D. W. Kennedy	58 Hook Ave.	
Joint Board Cloakmakers' Union		M. Yonpolsky	94 Spadina Ave.	
District Lodge, Inter. Association of Machinists		Jos. B. Murphy	2131 Dundas St.	
WINDSOR:				
Trades and Labour Council		F. J. Cook	88 Marentette Ave.	1st & 3rd Weds.
WELLAND:				
Trades and Labour Council		W. Powrie	Box 23	

ONTARIO INDUSTRIAL STATISTICS.

It is uphill work persuading the manufacturers of the Province to fill in and return the schedules that are sent to them for the purpose of obtaining information as to our industrial progress, but still there is a continual increase year by year, and there seems to be a growing conviction that the statistics thus obtained are treated as absolutely confidential so far as the identity of the firms and companies are concerned. Out of the 953 returns that have been received, 103 do not give sufficient material for tabulation in our second series, so that these tables contain 850 establishments as compared with 832 last year, and 819, 707, 642, 610, 536, 384 and 153 in the seven previous years. These tables show that 67,106 persons were employed, with aggregate wages amounting to $34,681,997, and product to $175,657,467; that the aggregate number of days in operation was 234,504, the annual average wage was $530.01, and the average daily wage was $1.92. The whole of the industrial statistics show continued progress.

RETURNS IN DETAIL

LUMBER MANUFACTURERS.

Office No.	Capital employed, including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
1	3,000	120	2,100	.....	2	600	25	.....	.....	2	.....
2	85,000	150	135,000	.....	25	800	2,800	.....	.....	85	.....
3	100,000	225	250,000	no	no	200	2,000	.....	.....	300	.....
4	.....	15	3,000	no	no	.....	.....	.....	.....	20	.....
5	125,000	....	.....	.....	.....	843	62,000	.....	.....	40	.....
6	8,000	70	7,500	.....	20	173	.....	.....	.....	16	.....
7	40,000	312	10,000	yes	.....	200	100	.....	.....	20	2
8	200,000	365	96,000	15	.....	158	.....	2,400	.....	410	.....
9	7,000	150	.....	10	.....	25	.....	400	.....	.....	.....
10	75,000	300	35,000	.....	25	500	1,800	.....	4,700	25	.....
11	25,000	200	16,000	.....	25	96	269	.....	7,944	13	.....
12	10,000	305	15,000	no	no	310	.....	100	.....	10	.....
13	8,000	120	22,000	.....	30	30	100	1,000	.....	30	.....
14	6,000	100	6,000	no	no	8	.....	2,000	.....	15	.....
15	5,500	90	3,500	5	.....	20	.....	.....	.....	3	.....
16	6,000	270	1,400	no	no	20	32	125	575	1	.....
17	40,000	305	30,000	no	no	350	300	.....	.....	50	.....
18	200,000	160	80,000	.....	2	1,200	4,800	3,800	.....	150	.....
19	10,000	200	6,000	.....	20	19	.....	.....	.....	5	.....
20	2,000	60	2,000	no	no	.....	.....	.....	.....	4	.....
21	7,000	125	9,503	.....	15	35	.....	150	.....	10	.....
22	50,000	313	.....	.....	.....	900	500	.....	.....	5	.....
23	40,000	220	10,000	.....	25	210	.....	700	.....	20	.....
24	.....	100	124,771	.....	.....	1,275	3,617	4,906	1,475	120	.....
25	3,000	250	.....	50	.....	32	8	.....	.....	8	.....
26	40,000	313	34,235	40	.....	224	170	.....	7,664	32	.....
27	40,000	150	40,000	25	.....	300	200	500	.....	15	.....
28	20,000	313	.....	.....	.....	160	42	.....	.....	2	.....
29	25,000	....	.....	.....	.....	.....	200	7,500	100	1	.....
30	150,000	200	150,000	no	no	300	3,000	2,000	.....	50	.....
31	12,000	203	10,000	25	.....	43	75	.....	.....	7	.....
32	20,000	313	15,000	30	.....	106	90	350	.....	8	.....
33	35,000	304	.....	.....	10	.....	.....	.....	.....	10	.....
34	75,000	312	250,000	no	no	539	6,000	2,000	.....	250	.....
35	1,500	120	1,500	75	.....	17	.....	.....	.....	3	.....
36	213,000	250	150,000	no	no	4,060	2,000	.....	.....	65	.....
37	71,150	300	184,470	25	.....	991	1,572	1,500	.....	50	.....
38	12,000	313	3,000	.....	5	1,600	1,500	300	.....	7	.....
39	100,000	300	100,000	no	no	220	.....	.....	.....	80	.....
40	100,000	120	50,000	.....	50	200	3,500	.....	.....	65	.....
41	13,673	100	6,000	no	no	28	110	.....	.....	10	.....
42	5,000	150	2,000	no	no	10	.....	.....	.....	3	.....
43	10,000	100	15,000	100	.....	22	130	.....	.....	6	.....
44	98,200	300	139,095	.....	yes	298	2,037	5,000	.....	122	6
45	200,000	150	840,000	.....	26	4,000	18,000	.....	.....	500	.....
46	20,000	265	20,000	20	.....	90	200	.....	.....	18	.....
47	500,000	290	590,000	.....	.....	2,000	5,682	30,000	.....	160	.....
48	10,000	100	14,000	40	.....	276	140	4,000	.....	20	.....
49	100,000	175	699,592	.....	yes	243	4,325	16,612	.....	200	.....
50	30,000	200	22,000	no	no	96	200	.....	.....	20	.....
51	.....	....	.....	.....	.....	3,000	.....	.....	.....	.....	.....
52	.....	....	.....	.....	.....	.....	400	.....	.....	4	.....
53	23,000	310	.....	.....	yes	160	526	.....	.....	9	.....
54	500,000	300	333,230	yes	.....	2,853	6,714	73,942	1,407	300	.....
55	126,545	305	50,000	.....	30	1,759	2,744	.....	14,000	35	.....
56	650,000	305	600,000	.....	14	2,694	19,434	23,000	52,000	560	.....

FROM MANUFACTURERS.

SAWMILLS.—TABLE NO. 1.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
200	.....	9 00	.....	.....	.....	....	....	.....	yes	....	.....	.....	1
35,000	.....	15 00	12 00	.....	.....	4	....	5,600	no	no	.....	.....	2
100,000	.....	.....	.....	.....	.....	1	....	.....	no	no	.....	.....	3
600	.....	21 50	12 00	.....	.....	....	....	.....	no	no	.....	.....	4
30,000	.....	.....	.....	.....	.....	3	....	3,200	10	....	10	.....	5
2,850	.....	12 00	10 50	.....	.....	....	....	600	10	....	.....	.....	6
8,000	100	13 50	.....	1 25	.....	....	....	.....	10	....	10	.....	7
22,000	.....	18 00	2 25	.....	.....	2	....	3,000	6	....	6	.....	8
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	9
13,336	.....	18 00	9 00	.....	.....	3	....	2,900	no	no	.....	.....	10
4,730	.....	.....	10 50	.....	.....	3	....	2,416	no	no	.....	.....	11
3,000	.....	15 00	9 00	.....	.....	....	....	.....	no	no	.....	.....	12
4,000	.....	12 00	9 00	.....	.....	....	....	.....	no	no	.....	.....	13
1,500	.....	.....	6 00	.....	.....	....	....	.....	10	....	10	.....	14
360	.....	.....	9 00	.....	.....	....	....	.....	.....	....	.....	.....	15
600	.....	.....	12 00	.....	.....	....	....	.....	.....	....	.....	.....	16
15,000	.....	12 00	9 00	.....	.....	2	....	1,500	no	no	.....	.....	17
40,000	.....	16 00	12 00	.....	.....	5	....	4,800	no	no	.....	.....	18
1,600	.....	12 00	10 50	.....	.....	1	....	400	no	no	.....	.....	19
250	.....	15 00	9 00	.....	.....	....	....	.....	1	....	1	.....	20
2,115	.....	13 50	12 00	.....	.....	....	....	.....	no	no	.....	.....	21
36,448	.....	21 50	12 00	.....	.....	2	....	2,000	no	no	.....	.....	22
4,400	.....	12 00	11 00	.....	.....	....	1	111	8	....	8	.....	23
24,270	.....	.....	.....	.....	.....	2	....	2,980	.....	....	.....	.....	24
300	.....	9 00	.....	.....	.....	....	....	.....	10	....	10	.....	25
11,480	.....	.....	.....	.....	.....	....	....	.....	10	....	10	.....	26
8,000	.....	15 00	12 00	.....	.....	3	....	2,000	10	no	10	.....	27
880	.....	.....	.....	.....	.....	1	....	480	25	....	25	.....	28
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	29
15,000	.....	24 00	12 00	.....	.....	3	....	3,000	no	no	.....	.....	30
2,842	.....	15 00	10 50	.....	.....	....	....	.....	10	....	10	.....	31
2,500	.....	.....	10 50	.....	.....	....	1	240	.....	....	.....	.....	32
.....	.....	.....	.....	.....	.....	....	2	.....	me	....	.....	.....	33
125,000	.....	.....	10 50	.....	.....	5	....	6,580	no	no	.....	.....	34
7,200	.....	.....	12 00	.....	.....	....	....	.....	.....	....	.....	.....	35
26,000	.....	20 00	10 15	.....	.....	....	1	600	10	....	10	10	36
33,126	.....	15 00	12 00	.....	.....	4	2	5,000	5	....	5	5	37
5,000	.....	18 00	12 00	.....	.....	....	....	.....	yes	....	.....	.....	38
50,000	.....	12 00	12 00	.....	.....	4	....	4,000	no	no	.....	.....	39
18,000	.....	.....	.....	.....	.....	3	1	6,400	.....	10	10	.....	40
5,000	.....	.....	12 00	.....	.....	....	....	.....	no	no	.....	.....	41
600	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	42
2,700	.....	12 00	10 50	.....	.....	....	....	.....	no	no	.....	.....	43
26,910	1,176	13 00	8 00	.....	5 50	7	4	6,123	10	....	10	.....	44
180,000	.....	32 00	10 50	.....	.....	16	....	28,000	5	....	5	5	45
6,400	.....	.....	.....	.....	.....	1	....	420	15	....	15	.....	46
102,000	.....	30 00	13 50	.....	.....	10	1	36,000	no	no	.....	.....	47
4,500	.....	21 50	12 00	.....	.....	1	....	800	5	....	5	5	48
92,515	.....	18 00	16 50	.....	.....	....	....	5,720	no	no	.....	.....	49
5,600	.....	16 50	12 00	.....	.....	....	....	.....	10	....	10	.....	50
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	51
1,250	.....	10 50	9 00	.....	.....	1	....	600	yes	....	.....	.....	52
.....	.....	mo60 00	mo 45 00	.....	.....	1	....	1,320	yes	....	.....	.....	53
125,732	.....	.....	12 00	.....	.....	5	1	8,837	no	no	.....	.....	54
14,000	.....	15 00	12 00	.....	.....	3	1	4,500	.....	40	40	.....	55
212,793	.....	15 00	12 00	.....	.....	7	....	11,600	no	no	.....	.....	56

RETURNS IN DETAIL

LUMBER MANUFACTURERS,

Office No.	Capital employed, including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
57	2,000	310	.....	50	.....	17	75	250	.....	1	.....
58	50,000	310	663,405	no	no	393	4,278	.....	5,000	165	.....
59	6,000	250	4,500	.....	¼	50	40	500	.....	3	.....
60	25,000	130	30,000	no	no	243	112	.....	.....	20	.....
61	10,000	250	8,000	25	.....	58	.....	800	.....	2	.....
62	3,000	150	4,000	.....	25	75	49	.....	50	5	.....
63	40.000	175	100,000	20	.....	162	2,000	5,000	1,000	80	.....
64	100,000	300	60,000	10	.....	300	.....	6,000	.....	30	1
65	5,000	160	6,000	.....	.....	52	60	.....	.....	4	.....
66	1,500	20	450	.....	yes	23	18	.....	.....	8	.....
67	25,000	116	40,000	.....	.....	470	252	.....	.....	22	.....
68	25,000	175	30,000	no	no	.....	300	.....	.....	80	.....
69	20,000	275	9,000	yes	.....	140	45	8	.....	16	1
70	.....	93	.....	.....	10	100	92	100	3,000	14	.....
71	.....	180	6,500	.....	.....	35	20	5,000	200	10	.....
72	2,500	50	400	30	.....	59	15	.....	.....	1	.....
73	100,000	200	130,000	.....	10	900	705	3,000	.....	60	.....
74	23,000	130	.....	.....	.....	350	280	.....	.....	6	.....
75	35,000	72	25,000	5	.....	123	200	1,000	8,275	16	.....
76	915,514	181	467,245	7	.....	1,505	11,352	2,197	342,340	238	.....
77	2,500	40	750	.....	50	.....	33	.....	.....	.....	.....
78	12,000	250	18,000	30	.....	1,200	300	2,000	100	12	.....
79	100,000	300	290,000	no	no	175	1,050	600	.....	65	.....
80	25,000	300	150,000	no	no	.....	700	.....	.....	12	.....
81	40,000	300	80,000	.....	.....	300	280	.....	.....	12	1
82	30,000	300	25,000	no	no	350	400	.....	.....	45	.....
83	1,500,000	300	692,000	15	.....	10.500	11.900	.....	.....	300	.....
84	300,000	184	460,000	no	no	1,900	7,000	.....	.....	135	.....
85	100,000	200	125,000	50	.....	500	800	.....	.....	50	1
86	30,000	310	90,000	20	.....	165	2,200	1,000	.....	100	.....
87	500,000	150	300,000	no	no	1,200	6,700	25,000	.....	125	.....
88	1,000,000	180	425,000	.....	30	2,100	.....	1,000	.....	150	.....
89	15,000	120	10,000	no	no	63	380	.....	.....	7	.....
90	8,000	100	14,000	no	no	102	79	.....	.....	12	.....
91	30,000	300	50,000	25	.....	125	300	200	.....	25	.....
92	.....	72	.....	.....	.....	.....	.....	.....	.....	6	.....
93	10,000	200	18,000	20	.....	60	250	.....	.....	12	.....
94	15,000	310	15,000	yes	.....	100000	.....	800	50	10	.....

PLANING MILLS, SASH AND DOOR

95	250,000	289	300,000	.....	14	3,296	3,106	35,000	.....	460	.....
96	9,000	310	53,000	17	.....	475	800	.....	.....	38	.....
97	75,000	300	182,788	33	.....	375	1,300	.....	.....	45	.....
98	50,000	300	100,000	10	.....	700	300	1,000	.....	23	.....
99	90,000	300	155,000	10	.....	700	500	.....	.....	50	.....
100	300,000	350	250,000	20	.....	700	3,000	15,000	12,000	200	.....
101	5,000	313	12,000	15	.....	50	50	200	.....	5	.....
102	70,000	313	175,000	5	.....	866	600	.....	.....	19	1
103	10,000	250	8,000	no	no	125	140	400	.....	5	.....
104	50,000	280	.....	yes	.....	250	200	.....	.....	25	.....

FROM MANUFACTURERS.

SAWMILLS—TABLE No. 1 (Continued).

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c	$ c.	$ c.			$	%	%	%	%	
600	.....	12 00	.....	.....	.....	...	...	.....	12½	...	12½	.....	57
73,443	.....	18 00	12 00	.....	.....	3	...	4,000	no	no	.....	.....	58
1,200	.....	9 00	.....	.....	.....	...	...	.....	.....	...	.....	.....	59
6,000	.....	15 00	12 00	.....	.....	...	...	.....	no	no	.....	.....	60
900	.....	.....	10 50	.....	.....	...	...	.....	.....	...	.....	.....	61
750	.....	.....	6 00	.....	.....	...	...	.....	10	...	10	.....	62
24,400	.....	12 00	9 00	.....	.....	1	...	1,000	no	no	.....	.....	63
12,000	both	15 00	10 50	6 00	.....	...	1	.....	10	...	10	.....	64
1,000	.....	.....	10 50	.....	.....	...	...	.....	no	no	.....	.....	65
520	.....	12 00	.....	.....	.....	...	...	.....	.....	...	.....	.....	66
6,477	both	15 00	10 50	.....	.....	...	1	296	no	no	.....	.....	67
15,000	.....	18 00	12 00	.....	.....	...	...	.....	15	...	15	.....	68
4,535	both	.....	.....	.....	.....	...	...	.....	.....	...	.....	.....	69
3,000	.....	13 80	.....	.....	.....	...	...	.....	.....	10	10	.....	70
2,250	.....	9 00	.....	.....	.....	...	...	.....	.....	...	.....	.....	71
75	.....	9 00	.....	.....	.....	...	...	.....	.....	...	.....	.....	72
35,000	.....	15 00	12 00	.....	.....	3	2	.....	yes	...	yes	.....	73
1,800	.....	18 00	10 50	.....	.....	...	...	.....	.....	...	.....	.....	74
3,276	.....	21 50	9 00	.....	.....	1	...	1,200	no	no	.....	.....	75
97,532	.....	.....	.....	.....	.....	5	1	12,320	no	no	.....	.....	76
.....	.....	.....	.....	.....	.....	...	...	.....	.....	...	.....	.....	77
4,500	.....	9 00	.....	.....	.....	...	...	.....	.....	...	.....	.....	78
39,849	.....	18 90	11 00	.....	.....	6	...	5,000	no	no	.....	.....	79
6,000	.....	.....	.....	.....	.....	3	...	2,400	.....	...	.....	.....	80
6,000	both	18 00	10 50	.....	.....	1	1	1,800	no	no	.....	.....	81
15,000	.....	12 00	9 00	.....	.....	3	...	2,000	no	no	.....	.....	82
150,000	.....	18 00	12 00	.....	.....	10	2	15,000	no	no	.....	.....	83
55,000	.....	24 00	10 50	.....	.....	4	...	4,500	no	no	.....	.....	84
27,000	300	18 00	10 50	6 00	.....	1	...	1,200	.....	...	.....	.....	85
37,500	.....	.....	.....	.....	.....	2	...	3,200	.....	10	10	.....	86
49,563	.....	25 00	13 50	.....	.....	2	...	1,900	no	no	.....	.....	87
130,000	.....	.....	.....	.....	.....	5	...	4,500	no	no	.....	.....	88
2,700	.....	.....	10 50	.....	.....	...	...	.....	no	no	.....	.....	89
2,500	.....	18 00	10 50	.....	.....	3	...	1,000	no	no	.....	.....	90
10,000	.....	18 00	10 50	.....	.....	1	...	300	10	...	10	.....	91
619	.....	10 40	9 00	.....	.....	...	...	.....	.....	...	.....	.....	92
4,500	.....	21 50	12 00	.....	.....	...	...	.....	no	no	.....	.....	93
4,000	.....	9 60	8 40	.....	.....	...	...	.....	yes	...	yes	yes	94

FACTORIES, ETC.—TABLE No 2.

130,000	.....	15 00	12 00	.....	.....	12	...	13,600	10	...	10	10	95
25,000	.....	21 50	15 00	.....	.....	3	...	2,600	8	...	8	8	96
24,777	.....	15 00	10 50	.....	.....	5	...	7,892	5	...	5	5	97
.....	.....	15 00	10 50	.....	.....	...	1	.....	no	no	.....	.....	98
29,700	.....	15 00	12 00	.....	.....	2	1	3,000	5	...	5	.....	99
65,000	.....	18 00	15 00	.....	.....	3	2	6,300	10	...	10	10	100
2,200	.....	15 00	9 00	.....	.....	...	...	.....	10	...	10	.....	101
20,000	520	21 50	12 00	10 00	.....	2	1	2,496	no	no	.....	.....	102
2,500	.....	21 50	9 00	.....	.....	...	...	.....	10	...	10	.....	103
12,000	.....	9 00	.....	.....	.....	...	...	.....	7	...	7	.....	104

RETURNS IN DETAIL

Planing Mills, Sash and Door

Office No.	Capital employed, including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
105	20,000	313	63,000	20	.....	180	400	.....	.....	16	.....
106	114,000	300	120,000	10	.....	400	2,800	4,000	1,800	50	1
107	35,000	313	10,000	5	.....	286	153	1,900	2,820	20	1
108	75,823	303	125,146	.....	5	503	1,536	2,493	.....	65	1
109	10,000	200	10,000	2	.....	69	5	.....	.....	5	.....
110	.....	270	18,000	11	.....	2,800	3,300	9,500	.....	.....	.....
111	50,100	310	.....	25	.....	154	633	.....	3,231	30	.....
112	15,000	235	12,000	no	no	35	171	60	.....	3	.....
113	130,000	300	96,460	10	.....	818	1,556	5,000	.....	60	.....
114	300,000	300	452,000	.....	10	2,189	5,215	10,000	15,900	200	.....
115	25,000	290	40,000	no	no	300	.....	.....	.....	24	.....
116	25,600	312	60,000	.....	.....	325	1,200	.....	4,000	20	.....
117	30,000	300	.....	.....	15	85	350	2,000	.....	6	.....
118	135,782	305	230,824	7	.....	1,492	.....	.....	.....	17	.....
119	35,000	120	8,000	no	no	200	50	.....	.....	7	.....
120	175,000	308	301,800	21	.....	1,850	4,750	8,060	3,772	94	.....
121	37,776	250	31,154	.....	20	101	490	.....	4,476	13	.....
122	6,000	300	.....	.....	.....	.....	.....	3,000	.....	14	.....
123	.....	302	25,000	15	.....	106	85	.....	.....	7	.....
124	200,000	300	225,000	.....	yes	450	1,200	.....	.....	40	.....
125	63,000	306	252,582	.....	10	1,109	1,679	.....	22,422	47	.....

Woodworking Factories, Specialties

126	4,000	300	5,000	no	no	100	48	150	.....	1	.....
127	12,000	300	.....	.....	.....	.....	.....	.....	.....	6	2
128	30,000	265	35,000	15	.....	163	250	1,000	17,000	34	9
129	10,000	30	5,000	.....	33⅓	35	.....	.....	.....	14	.....
130	200,000	300	165,000	15	.....	136	1,640	4,260	.....	95	.....
131	45,000	313	.....	.....	yes	337	1,131	.....	.....	45	.....
132	100,000	300	203,000	5	.....	300	550	2,000	.....	40	.....
133	96,000	300	150,000	15	.....	650	988	2,000	180	48	31
134	6,000	260	4,304	.....	50	51	61	10,000	1,712	3	1
135	20,000	300	40,000	20	.....	.....	98	.....	.....	45	5
136	23,700	280	40,000	9	.....	72	655	2,330	2,310	36	6
137	9,000	300	21,000	no	no	32	275	.....	.....	30	4
138	203,330	288	210,000	20	.....	650	1,200	2,500	4,250	110	12
139	10,000	312	.....	no	do	90	100	.....	.....	7	.....
140	30,000	200	31,000	20	.....	119	506	200	.....	30	.....
141	40.000	275	35,000	yes	.....	150	600	.....	.....	20	.....
142	75,000	300	55,000	yes	.....	225	1,365	1,000	.....	45	.....
143	200,000	313	.....	.....	.....	450	221	.....	.....	.....	.....
144	36,000	311	26,500	10	.....	120	225	500	.....	20	.....
145	5,850	305	5,730	.....	15	73	200	.....	.....	6	.....
146	65,000	300	98,000	5	.....	144	1,150	1,500	4,500	260	.....
147	33,000	275	110,000	10	.....	226	870	5,122	75,000	9	11
148	40,000	305	60,000	yes	.....	.....	110	.....	.....	20	.....
149	150,000	312	135,000	35	.....	.....	1,400	10,000	.....	100	25
150	4,000	90	1,400	no	no	45	.....	50	.....	4	.....
151	30,000	305	.....	.....	.....	.....	.....	.....	.....	.....	.....
152	26,000	300	12,000	.....	2	550	75	100	3,675	5	.....
153	60,000	295	82,000	11	.....	.....	.....	.....	.....	33	7
154	53,695	304	60,000	5	.....	592	679	.....	3,343	50	.....

FROM MANUFACTURERS.

FACTORIES, ETC.—TABLE No. 2.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
8,700	.....	18 00	12 00	.....	.....	1	....	350	5	....	5	.....	105
30,000	520	21 50	9 00	.....	.....	3	1	4,000	no	no	.....	.....	106
10,000	600	21 50	9 50	12 00	.....	1	1	1,600	no	no	.....	.....	107
23,298	300	21 50	10 00	.....	.....	3	1	3,000	5	....	5	.....	108
2,000	.....	12 00	9 00	.....	.....	....	....	.....	10	....	10	.....	109
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	110
11,815	.....	21 50	9 00	.....	.....	4	....	4,000	yes	....	yes	yes	111
1,350	.....	12 00	9 00	.....	.....	1	....	600	no	no	.....	.....	112
48,659	.....	.....	.....	.....	.....	4	1	6,985	no	no	.....	.....	113
15,000	.....	21 50	12 00	.....	.....	11	2	18,900	.....	....	.....	.....	114
120,000	.....	24 00	.....	.....	.....	2	....	2,000	5	....	5	.....	115
12,000	.....	24 00	15 00	.....	.....	3	....	5,200	no	no	.....	.....	116
2,750	.....	12 00	7 00	.....	.....	1	....	600	no	no	.....	.....	117
12,353	.....	.....	14 88	.....	.....	3	....	5,575	no	no	.....	.....	118
5,000	.....	15 00	10 50	.....	.....	....	....	.....	no	no	.....	.....	119
44,338	.....	18 00	15 00	.....	.....	6	2	10,864	10	....	10	10	120
5,573	.....	15 00	6 00	.....	.....	2	1	3,390	no	no	.....	.....	121
12,000	.....	18 00	12 00	.....	.....	....	....	.....	.....	....	.....	.....	122
3,785	.....	.....	.....	.....	.....	....	....	.....	10	....	10	.....	123
28,100	.....	18 00	12 00	.....	.....	3	1	5,000	no	no	.....	.....	124
28,920	.....	18 00	10 50	.....	.....	6	1	10,320	no	no	.....	.....	125

IN WOODENWARE.—TABLE No. 3.

.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	126
4,400	750	20 00	12 00	7 00	5 00	1	1	1,800	.....	....	.....	.....	127
9,710	2,250	.....	.....	.....	.....	....	1	350	no	no	.....	.....	128
1,000	.....	18 00	9 00	.....	.....	....	....	.....	10	....	10	.....	129
35,000	.....	20 00	.....	.....	.....	2	....	4,200	12½	....	12½	.....	130
25,350	.....	15 00	9 00	.....	.....	6	2	8,750	no	no	.....	.....	131
23,196	.....	15 00	12 00	.....	.....	2	1	5,450	no	no	.....	.....	132
29,159	both	17 00	13 50	10 50	7 00	5	6	7,874	no	no	.....	.....	133
923	189	18 00	9 00	7 00	5 00	....	....	.....	15	....	15	.....	134
25,840	1,560	21 50	12 00	10 00	9 00	....	1	.....	10	....	10	.....	135
15,358	216	12 00	8 00	6 00	4 00	2	1	3,532	10	....	10	.....	136
11,000	1,200	.....	.....	.....	.....	....	....	.....	no	no	.....	.....	137
53,860	4,412	15 00	10 50	9 00	6 00	6	2	9,200	no	no	.....	.....	138
2,500	.....	.....	9 00	.....	.....	....	....	.....	no	no	.....	.....	139
10,904	.....	18 00	10 50	.....	.....	2	....	2,000	5	....	5	5	140
14,000	.....	13 50	9 00	.....	.....	....	....	.....	10	....	10	.....	141
19,000	.....	.....	10 50	.....	.....	4	1	4,800	no	no	.....	.....	142
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	143
9,800	.....	18 00	15 00	.....	.....	2	....	2,000	no	no	.....	.....	144
2,820	.....	12 00	7 50	.....	.....	....	....	.....	no	no	.....	.....	145
24,487	.....	18 00	15 00	.....	.....	4	....	4,000	yes	....	yes	.....	146
4,622	3,428	.....	19 00	.....	7 50	2	....	4,500	6	....	6	6	147
18,000	.....	24 00	18 00	.....	.....	2	....	2,800	.....	....	.....	.....	148
50,000	both	.....	.....	.....	.....	....	....	.....	no	no	.....	.....	149
.....	.....	1 50	.....	.....	.....	....	....	.....	.....	....	.....	.....	150
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	151
4,000	.....	16 50	.....	.....	.....	1	....	1,000	10	....	10	.....	152
22,000	3,000	18 00	10 00	9 00	.....	1	....	1,500	12	....	12	.....	153
38,152	.....	18 90	11 88	.....	.....	6	1	6,999	6	....	6	.....	154

RETURNS IN DETAIL

Woodworking Factories, Specialties

Office No.	Capital employed, including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
155	150,000	300	185,000	no	no	273	2,252	1,000	10,650	68	.....
156	20,000	300	30,000	.....	5	1,000	600	.....	.....	15	.....
157	25,000	275	50,000	.....	10	35	1,200	.....	1,100	23	.....
158	564,063	295	376,726	.....	15	1,236	1,209	2,494	45,903	127	25
159	1,500	290	1,200	.....	yes	150	120	.....	.....	4	.....
160	25,000	300	40,000	.....	yes	362	250	189	1,216	12	1
161	100,000	301	113,714	45	.....	302	751	18,886	22,211	15	91
162	45,000	305	88,000	10	.....	1,890	560	2,000	2,000	30	.....
163	26,228	276	16,127	36	.....	6	55	957	.....	10	.....
164	100,000	241	70,138	15	.....	83	850	3,000	9,678	80	.....
165	240,000	305	197,000	.....	15	762	1,876	2,791	4,160	105	.....
166	20,000	305	30,000	.....	20	272	357	.....	.....	20	.....
167	4,000	208	10,000	5	.....	.....	27	.....	.....	3	1
168	40,000	300	25,000	yes	.....	250	500	2,500	.....	40	1
169	50,000	305	8,385	.....	25	160	394	.....	.....	11	.....
170	2,500	300	7,700	no	no	155	50	.....	.....	5	.....
171	17,579	310	30,613	yes	.....	105	200	.....	200	10	1
172	192,000	275	275,000	.....	10	937	1,100	20,000	3,269	75	12
173	37,900	310	73,209	.....	3	27	195	.....	50,443	12	2
174	1,000	200	1,500	.....	.....	.....	.....	.....	.....	.....	.....
175	35,000	300	30,000	10	.....	175	500	.....	.....	25	.....
176	35,000	300	93,000	no	no	40	513	1,548	.....	33	8
177	6,000	250	2,840	20	.....	55	76	50	235	3	.....
178	25,000	300	55,200	.....	.....	240	327	.....	.....	23	.....
179	15,000	270	3,500	no	no	150	250	.....	.....	4	1
180	30,600	300	38,511	yes	.....	333	1,191	10,000	3,161	40	8

Furniture Manufacturers; Bank, Store

181	150,000	290	133,000	no	no	1,046	1,998	.....	.....	55	.....
182	8,387	290	8,060	60	.....	45	132	8,500	.....	7	.....
183	122,989	300	75,000	no	no	415	150	.....	.....	40	.....
184	903,295	300	438,799	.....	2	3,719	3,026	.....	102,638	130	.....
185	80,000	275	64,000	no	no	1,100	21	.....	.....	20	.....
186	44,890	305	50,497	no	no	97	1,126	.....	3,851	38	.....
187	200,000	305	148,875	.....	3	1,100	800	.....	6,500	70	.....
188	19,600	287	32,500	no	no	74	594	.....	2,567	18	.....
189	109,000	315	80,000	12	.....	363	1,280	7,380	7,710	54	.....
190	80,000	300	86,638	.....	45	532	245	.....	43,540	65	.....
191	34,000	300	64,000	.....	8	154	880	525	38,182	45	.....
192	8,000	300	12,000	no	no	115	38	.....	.....	4	1
193	200,000	300	175,000	15	.....	544	317	7,000	.....	70	.....
194	320,000	295	513,000	4	.....	1,085	1,610	6,000	.....	345	.....
195	65,000	305	80,000	no	no	170	2,000	1,200	9,000	42	.....
196	135,000	300	200,000	no	no	308	874	1,649	.....	55	.....
197	8,000	300	65,000	no	no	153	325	.....	.....	28	1
198	80,000	300	90,000	10	.....	100	1,200	10,000	.....	65	.....
199	44,450	300	72,000	7	.....	127	2,202	1,389	.....	48	1
200	88,500	300	115,200	.....	6	485	1,005	.....	4,000	66	1
201	54,000	286	77,600	3	.....	70	822	700	8,028	56	1
202	100,000	250	77,000	.....	40	162	1,400	10,000	.....	55	3
203	75,000	305	80,400	.....	5	125	850	.....	.....	47	1
204	150,000	300	150,000	10	.....	375	1,200	1,000	.....	90	.....
205	295,000	305	311,624	.....	7	1,070	1,370	2,951	.....	168	1

FROM MANUFACTURERS.

IN WOODENWARE.—TABLE NO. 3.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
30,000	.....	18 00	9 00	.....	.....	....	2	936	no	no	.....	.....	155
7,500	.....	15 00	10 50	.....	.....	....	....	.....	5	....	5	.....	156
14,500	.....	18 00	9 00	.....	.....	1	1	3,000	10	....	10	.....	157
81,069	both	15 00	9 00	9 00	6 00	8	....	14,500	no	no	.....	.....	158
2,400	.....	14 00	10 00	.....	.....	1	....	600	.....	....	.....	.....	159
9,403	495	18 00	10 00	.....	.....	....	1	495	.....	....	.....	.....	160
9,803	29,268	20 00	12 00	9 00	6 00	9	29	57,984	23	....	23	.....	161
6,852	.....	.....	9 00	.....	.....	....	1	1,800	.....	....	.....	.....	162
12,299	.....	.....	.....	.....	.....	....	1	528	yes	....	yes	.....	163
50,232	.....	.....	.....	.....	.....	4	....	3,000	15	....	15	.....	164
44,926	.....	11 10	9 60	.....	.....	2	1	7,200	5	....	5	.....	165
12,000	.....	15 00	.....	.....	.....	2	1	1,775	no	no	.....	.....	166
1,248	208	14 10	7 50	6 00	.....	....	....	.....	no	no	.....	.....	167
22,000	1,890	14 00	.....	.....	.....	....	....	.....	7	....	7	.....	168
6,084	.....	12 00	9 00	.....	.....	1	....	900	.....	....	.....	.....	169
4,000	.....	18 00	15 00	.....	.....	....	....	.....	no	no	.....	.....	170
7,070	260	18 00	12 00	5 00	.....	....	....	.....	10	....	10	.....	171
46,600	4,000	14 00	7 00	8 00	.....	4	4	9,508	5	....	5	5	172
9,342	572	15 60	.....	9 00	.....	1	1	1,964	yes	....	yes	.....	173
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	174
8,000	.....	12 00	.....	.....	.....	1	....	1,000	10	....	10	.....	175
13,497	2,400	piecew'k	piece	work	.....	5	....	4,400	5	....	5	.....	176
1,494	.....	21 50	.....	.....	.....	....	....	.....	10	....	10	.....	177
9,360	.....	18 00	12 00	.....	.....	....	....	.....	.....	....	.....	.....	178
2,000	200	12 00	.....	6 00	.....	....	1	.....	25	....	25	.....	179
13,237	1,891	15 00	10 50	6 00	4 00	5	1	5,978	..	....	.....	.....	180

AND OFFICE FITTINGS.—TABLE NO. 4.

40,000	.....	18 00	12 00	.....	.....	....	....	.....	.....	....	.....	.....	181
3,057	.....	13 50	10 50	.....	.....	....	....	.....	10	....	10	.....	182
24,446	.....	.....	.....	.....	.....	3	....	4,300	no	no	.....	.....	183
56,638	.....	19 50	11 00	.....	.....	11	....	9,068	no	no	.....	.....	184
10,000	.....	.....	.....	.....	.....	1	....	2,000	yes	....	yes	.....	185
15,681	.....	16 50	10 50	.....	.....	1	1	1,720	no	no	.....	.....	186
43,002	.....	20 00	14 00	.....	.....	4	1	6,000	5	....	5	5	187
11,465	.....	18 00	12 00	.....	.....	1	....	1,400	no	no	.....	.....	188
28,952	.....	16 00	9 00	.....	.....	3	2	4,197	no	no	.....	.....	189
29,954	.....	21 50	10 00	.....	.....	3	....	4,474	yes	....	yes	.....	190
17,592	.....	13 50	10 00	.....	.....	1	1	2,000	7	....	7	.....	191
2,700	300	15 00	12 00	3 00	.....	....	....	.....	no	no	.....	.....	192
37,628	.....	15 00	12 00	.....	.....	3	1	7,046	3	....	3	.....	193
161,460	.....	15 00	10 50	.....	.....	17	....	9,775	5	....	5	5	194
23,600	.....	15 00	10 50	.....	.....	2	1	2,900	10	....	10	10	195
25,575	.....	.....	.....	.....	.....	3	....	2,400	no	no	.....	.....	196
12,000	300	.....	.....	.....	.....	3	....	3,800	no	no	.....	.....	197
30,000	.....	16 50	10 50	.....	.....	1	1	1,375	5	....	5	.....	198
19,749	both	15 00	10 00	.....	.....	1	1	1,600	3	....	3	.....	199
30,300	.....	15 00	10 00	.....	.....	3	1	4,600	10	....	10	.....	200
29,611	32	15 00	9 00	.....	.....	3	1	2,650	5	....	5	5	201
20,000	1,000	12 00	10 50	12 00	.....	2	2	4,000	no	no	.....	.....	202
24,215	both	16 00	10 50	.....	6 00	2	2	4,875	5	....	5	5	203
40,000	.....	13 50	9 00	.....	.....	3	2	4,200	5	....	5	5	204
101,979	300	13 50	9 00	9 00	.....	4	2	8,242	no	no	.....	.....	205

RETURNS IN DETAIL

FURNITURE MANUFACTURES; BANK, STORE AND

Office No.	Capital employed, including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
206	159,540	292	272,000	.....	1	423	852	.....	.....	183	2
207	10,000	300	30,000	5	.....	2,050	2,050	.....	.....	16	.....
208	25,000	305	.....	.....	33⅓	75	75	.....	.....	6	4
209	100,000	300	90,000	7	.....	500	350	1,200	.....	78	5
210	1,025,368	300	1,249,335	5	.....	7,230	27,411	90,000	91,527	645	30
211	509,743	275	298,448	.....	yes	2,613	1,536	17,952	.....	210	25
212	150,000	300	225,000	.....	15	452	634	.....	.....	115	2
213	100,000	313	115,228	.....	.....	826	1,145	.....	.....	70	.....
214	238,345	300	177,381	no	no	1,105	525	38,075	27,538	90	.....
215	500,000	300	475,000	6	.....	534	1,314	30,000	5,000	333	22
216	90,000	300	53,000	.....	9	277	449	464	5,682	44	1
217	150,500	300	180,000	14	.....	386	1,049	.....	.....	125	.....
218	105,181	300	76,980	6	.....	271	387	1,808	36,010	41	.....
219	50,000	300	25,000	.....	15	800	300	500	.....	25	1
220	111,993	275	91,724	.....	25	160	1,490	7,447	6,315	43	2
221	6,600	275	30,000	3	.....	79	150	500	.....	8	4
222	100,000	300	100,000	no	no	800	1,500	6,000	.....	60	.....
223	200,000	300	295,000	20	.....	1,900	5,200	3,000	21,000	100	2
224	50,000	300	69,000	5	.....	750	500	1,000	.....	35	3
225	10,000	300	20,000	yes	.....	30	30	.....	.....	12	.....
226	238,345	300	176,359	.....	.....	1,055	500	38,075	27,538	95	.....
227	200,000	303	190,000	10	.....	537	1,792	.....	.....	158	.....
228	162,576	300	165,350	.....	20	540	148	6,595	102,426	65	5
229	8,000	300	16,000	.....	20	111	75	.....	.....	10	.....
230	60,000	290	30,000	.....	15	150	683	.....	.....	32	.....

CARRIAGES AND OTHER VEHICLES AND PARTS

231	30,000	300	25,000	no	no	141	300	.....	.....	8	.....
232	2,904,846	300	7,500,000	60	.....	2,478	16,312	887,045	541,867	900	.....
233	500,000	305	675,390	.....	14	2,868	.....	1,685	680,019	.....	.....
234	400,000	313	2,322,640	53	.....	2,034	540	12,000	.....	188	.....
235	145,786	308	206,438	.....	29	811	1,433	5,619	47,088	55	.....
236	.....	....	.....	.....	.....	40	.....	.....	.....	.....	.....
237	103,000	280	.....	no	no	200	500	200	.....	35	.....
238	75,544	304	24,500	no	no	520	186	.....	.....	13	.....
239	100,000	300	175,000	18	.....	775	350	2,000	.....	100	15
240	20,000	90	5,000	.....	50	25	60	.....	.....	2	.....
241	20,000	300	24,000	no	no	120	200	600	.....	13	.....
242	35,000	300	35,000	no	no	50	500	.....	.....	15	.....
243	250,000	300	170,000	no	no	200	2,700	700	.....	75	4
244	850,000	300	500,000	25	.....	943	3,433	25,000	50,000	300	.....
245	100,000	300	177,329	6	.....	222	731	.....	15,250	60	1
246	80,000	275	50,000	yes	.....	90	850	.....	.....	20	.....
247	100,000	300	85,000	.....	15	250	1,200	500	.....	55	2
248	200,000	300	760,000	5	.....	500	3,430	5,630	.....	330	15
249	90,000	308	110,739	.....	100	579	1,420	.....	6,632	75	3
250	30,000	300	52,000	.....	10	259	502	.....	1,100	18	2
251	150,000	300	118,639	no	no	679	1,695	.....	7,953	50	.....
252	183,553	280	428,624	22	.....	2,415	1,177	63,878	50,905	150	4
253	3,000	300	4,000	yes	.....	15	75	.....	.....	3	.....
254	103,000	280	50,000	no	no	200	500	200	.....	35	.....
255	30,000	275	45,000	.....	yes	135	700	275	.....	14	.....
256	656,908	294	626,391	.....	20	2,698	1,257	25,985	251,956	600	50

FROM MANUFACTURERS.

OFFICE FITTINGS.—TABLE NO. 4.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
83,128	584	11 00	8 00	6 00	.....	6	3	6,545	10	....	10	10	206
12,000	.....	16 00	.....	.....	.....	1	1	2,000	5	....	5	.....	207
.....	.....	18 00	10 50	9 00	6 50	....	....	.....	no	no	.....	.....	208
29,000	1,300	12 00	8 00	8 00	5 50	3	1	4,000	8	....	8	.....	209
311,161	11,000	18 00	12 00	9 00	.....	60	15	72,394	5	....	5	5	210
95,331	5,501	16 00	8 50	6 00	4 50	8	7	23,328	7½	....	7½	½	211
50,000	both	12 00	8 40	.....	6 00	4	2	7,600	4	....	4	.....	212
40,303	.....	.....	.....	.....	.....	5	....	5,500	yes	....	yes	.....	213
53,299	.....	18 00	12 00	.....	.....	4	....	7,942	10	....	10	.....	214
194,000	10,000	18 00	9 90	7 25	4 25	13	9	16,500	no	no	.....	.....	215
20,573	both	12 00	8 40	.....	.....	5	2	6,330	3	....	3	.....	216
54,000	.....	15 00	9 00	.....	.....	6	2	6,800	no	no	.....	.....	217
20,319	.....	12 00	10 00	.....	.....	1	1	2,000	no	no	.....	.....	218
10,000	300	12 00	9 00	6 00	.....	4	....	1,350	10	....	10	.....	219
18,638	715	.....	.....	.....	.....	4	2	6,761	no	on	.....	.....	220
4,560	1,200	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	221
30,000	.....	18 00	12 00	.....	.....	4	....	6,000	no	no	.....	.....	222
55,600	1,150	25 00	15 00	.....	.....	14	4	26,000	no	no	.....	.....	223
20,000	500	18 00	15 00	.....	.....	3	2	5,500	5	....	5	.....	224
7,500	.....	.....	.....	.....	.....	....	....	.....	no	no	.....	.....	225
55,843	.....	16 50	12 00	.....	.....	3	....	7,972	.....	....	.....	.....	226
59,952	.....	12 00	10 20	.....	.....	5	2	7,650	10	....	10	.....	227
31,128	1,644	15 00	10 50	7 50	.....	5	1	6,050	no	no	.....	.....	228
3,680	.....	15 00	8 25	.....	.....	....	....	.....	no	no	.....	.....	229
13,551	.....	12 00	9 00	.....	.....	1	1	1,750	8	....	8	.....	230

THEREOF AND MOTORS. TABLE NO, 5.

10,000	.....	21 50	.....	.....	.....	2	....	2,000	no	no	.....	.....	231
661,543	both	16 00	.....	.....	.....	116	....	102,124	1	....	1	1	232
122,973	.....	.....	.....	.....	.....	7	1	16,723	no	no	.....	.....	233
139,438	.....	16 00	.....	.....	.....	....	....	51,381	no	no	.....	.....	234
33,537	.....	20 00	10 50	.....	.....	2	1	3,100	no	no	.....	.....	235
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	236
.....	.....	15 00	10 50	.....	.....	3	1	3,200	yes	....	yes	.....	237
6,757	.....	15 00	9 00	.....	.....	1	....	1,200	no	no	.....	.....	238
60,400	4,500	18 00	10 50	8 00	5 00	6	1	6,100	no	no	.....	.....	239
250	.....	12 00	.....	.....	.....	....	....	.....	no	no	.....	.....	240
5,200	.....	12 00	.....	.....	.....	....	....	.....	no	no	.....	.....	241
6,750	.....	12 00	8 50	.....	.....	....	1	350	no	no	.....	.....	242
42,000	1,500	22 50	9 00	7 50	.....	3	2	5,000	10	....	10	.....	243
150,000	.....	21 50	10 50	.....	.....	16	4	27,000	10	....	10	10	244
30,800	416	12 00	9 00	8 00	.....	4	1	7,500	no	no	.....	.....	245
12,000	.....	.....	.....	.....	.....	1	1	2,000	no	no	.....	.....	246
16,000	600	16 50	9 00	6 00	.....	2	2	4,400	no	no	.....	.....	247
145,000	6,000	18 00	10 50	8 00	.....	15	5	18,500	8	....	8	8	248
36,012	1,200	19 50	12 00	12 00	.....	4	1	6,921	.....	10	10	10	249
10,000	1,000	15 00	10 50	10 20	7 50	5	1	4,000	no	no	.....	.....	250
22,983	.....	15 00	9 90	.....	.....	3	2	6,027	no	no	.....	.....	251
87,885	both	18 00	12 00	.....	.....	5	4	13,875	30	....	30	.....	252
1,200	.....	9 00	.....	.....	.....	....	....	.....	no	no	.....	.....	253
12,300	.....	15 00	10 50	.....	.....	3	1	3,200	yes	....	yes	.....	254
7,800	.....	15 00	12 00	.....	.....	1	1	2,700	no	no	.....	.....	255
299,669	14,466	15 00	12 00	7 50	6 00	20	5	37,267	.....	....	.....	.....	256

RETURNS IN DETAIL

AGRICULTURAL IMPLEMENTS, FARMING HAND

Office No.	Capital employed, including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
257	50,000	280	32,000	no	no	40	370	.....	.....	10	.....
258	33,000	300	50,000	28	.....	132	584	6,436	.....	30	.....
259	10,000	300	6,000	.....	30	61	.....	150	.....	4	.....
260	225,000	300	216,116	.....	yes	794	4,351	.....	.....	130	3
261	40,000	250	37,500	.....	10	236	260	875	.....	28	.....
262	150,000	280	215,000	5	.....	180	1,150	14,000	.....	78	.....
263	.....	300	.....	.....	.....	127	100	500	.....	9	.....
264	175,000	313	35,000	.....	.....	229	925	100	.....	38	.....
265	244,000	275	91,000	10	.....	622	400	76,000	.....	45	.....
266	85,000	303	7,140	no	no	158	98	.....	.....	10	.....
267	50,000	300	.....	yes	.....	598	426	.....	69,175	10	.....
268	700,000	224	642,669	20	.....	2,421	6,079	20,000	62,256	370	.....
269	500,000	305	350,000	25	.....	1,600	4,000	30,000	.....	40	50
270	500,000	310	500,000	50	.....	2,000	2,900	5,000	350,000	200	.....
271	160,000	310	75,000	no	no	.....	3,000	1,000	.....	40	1
272	205,021	309	361,745	60	.....	431	2,750	13,330	57,510	169	.....

PIANO, ORGAN AND MUSICAL INSTRUMENT

273	100,000	305	238,251	.....	13	584	572	.....	.....	75	2
274	1,000	300	4,499	.....	17	10	.....	.....	.....	2	.....
275	75,000	300	150,000	10	.....	750	1,100	.....	.....	27	1
276	150,000	300	120,000	.....	25	1,600	350	.....	.....	65	.....
277	22,600	300	34,200	20	.....	110	520	151	2,039	30	.....
278	1,051,488	313	385,128	9½	.....	718	4,614	.....	.....	23	.....
279	100,000	300	85,288	21	.....	408	706	602	2,764	30	.....

WOOD-PULP FACTORIES, PAPER MILLS, STATIONERY

280	16,000	250	32,000	10	.....	70	160	2,300	.....	4	18
281	15,000	305	30,000	10	.....	200	90	.....	1,500	9	10
282	10,000	80	8,771	.....	50	75	210	.....	.....	10	13
283	35,000	210	60,000	10	.....	200	200	15,000	.....	5	20
284	90,000	313	50,000	5	.....	576	550	1,000	.....	10	25
285	30,000	300	62,365	9	.....	133	353	1,000	.....	8	40
286	10,600	60	10,000	.....	.....	56	.....	.....	1,071	3	.....
287	275,000	300	450,000	2	.....	400	200	5,000	.....	25	125
288	100,000	205	185,000	35	.....	225	322	.....	.....	25	15
289	26,872	300	46,000	no	no	.....	100	.....	.....	15	.....
290	160,000	300	231,000	10	.....	1,585	650	13,000	.....	40	120
291	3,000	300	10,000	.....	.....	20	50	.....	.....	3	6
292	26,000	260	35,000	6	.....	124	1,800	.....	.....	5	20
293	78,043	300	140,751	12	.....	601	586	2,238	11,098	70	.....
294	38,700	300	30,000	no	no	147	715	500	420	12	8
295	750,000	280	659,889	.....	14	1,981	2,380	44,657	512,383	150	50
296	200,000	270	87,800	.....	.....	232	307	.....	.....	26	8
297	127,000	300	178,000	10	.....	285	735	9,562	46,443	12	48
298	75,000	300	75,000	25	.....	100	.....	10,000	.....	20	7
299	40,000	313	83,500	5	.....	292	405	.....	.....	15	25
300	275,000	231	108,700	.....	17	294	981	.....	28,400	30	.....
301	55,000	300	11,800	15	.....	270	590	6,000	.....	11	42
302	476,334	300	433,507	no	no	1,020	5,039	13,839	.....	110	15

FROM MANUFACTURERS.

TOOLS AND DAIRY MACHINERY.—TABLE NO. 6.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
5,000	.....	15 00	10 50	.....	.....	1	1	1,700	5	....	5	.....	257
18,397	.....	18 00	12 00	.....	.....	5	1	5,200	10	....	10	8	258
2,288	.....	11 00	.....	.....	.....	....	....	.....	no	no	.....	.....	259
82,976	both	18 00	12 00	10 50	.....	....	....	.....	5	....	5	5	260
14,500	.....	16 50	12 00	.....	.....	2	....	2,400	10	....	10	10	261
44,000	.....	.....	.....	.....	.....	3	2	9,000	8	....	8	8	262
3,500	.....	18 00	9 00	.....	.....	....	....	.....	.....	....	.....	.....	263
12,854	.....	15 00	10 00	.....	.....	....	1	480	.....	....	.....	.....	264
24,000	.....	18 00	12 00	.....	.....	3	1	6,000	no	no	.....	.....	265
5,389	.....	15 00	9 00	.....	.....	2	....	2,000	no	no	.....	.....	266
6,450	.....	15 00	12 00	.....	.....	7	10	17,856	8	....	8	.....	267
212,650	.....	14 58	10 80	.....	.....	17	3	20,678	no	no	.....	.....	268
35,000	.....	.....	.....	.....	.....	3	2	7,500	no	no	.....	.....	269
115,000	.....	18 00	9 00	.....	.....	25	10	26,000	no	no	.....	.....	270
30,000	both	18 00	12 00	9 00	7 50	6	6	3,000	6	....	.....	6	271
118,255	.....	14 15	14 15	.....	.....	16	3	8,137	no	no	.....	.....	272

FACTORIES.—TABLE NO. 7.

56,493	936	.....	.....	.....	.....	3	....	7,500	.....	11	11	11	273
900	.....	12 00	6 00	.....	.....	....	....	.....	14	....	14	.....	274
20,000	700	.....	.....	.....	.....	5	1	both	no	no	.....	.....	275
23,000	.....	16 50	14 00	.....	.....	2	....	3,500	no	no	.....	.....	276
12,650	.....	.....	.....	.....	.....	2	1	2,900	.....	....	.....	.....	277
127,926	.....	21 50	10 50	.....	.....	8	4	13,008	no	no	.....	.....	278
19,443	.....	18 00	10 50	.....	.....	2	1	4,770	no	no	.....	.....	279

FACTORIES.—TABLE NO. 8.

2,250	6,050	15 00	7 50	8 00	4 00	1	....	1,000	10	....	10	10	280
5,100	2,700	17 00	8 00	7 50	4 50	1	1	1,500	10	....	10	10	281
842	549	13 50	.....	.....	6 00	....	....	.....	no	no	.....	.....	282
3,500	4,500	15 00	9 00	9 00	6 00	1	1	1,500	15	....	15	.....	283
5,772	6,146	15 00	12 00	piece	3 00	1	2	2,756	3	....	3	.....	284
5,400	13,175	.....	.....	.....	.....	3	1	5,600	yes	....	.....	.....	285
1,015	1,200	9 00	.....	.....	.....	....	....	.....	.....	....	.....	.....	286
12,500	31,250	12 00	.....	9 00	4 50	10	5	17,500	15	....	15	.....	287
20,696	both	18 00	13 50	9 00	7 00	2	2	4,200	5	....	5	.....	288
4,198	.....	18 00	10 50	.....	.....	1	1	1,968	2	....	2	2	289
18,000	32,000	13 00	9 00	10 00	7 00	5	3	7,000	5	....	5	5	290
1,025	1,800	7 50	.....	.....	6 00	....	....	.....	.....	....	.....	.....	291
3,000	5,050	18 00	12 00	9 60	5 40	1	....	900	yes	....	yes	yes	292
49,735	.....	.....	.....	.....	.....	7	....	5,198	10	....	10	.....	293
7,980	2,280	15 00	9 00	7 00	3 00	2	1	2,500	no	no	.....	.....	294
76,651	14,000	15 00	10 50	7 50	5 40	9	2	16,050	no	no	.....	.....	295
14,050	1,950	18 00	12 00	1 25	.....	4	2	7,257	no	no	.....	.....	296
27,162	both	.....	.....	.....	.....	10	5	7,465	.....	....	.....	.....	297
14,000	both	18 00	12 00	.....	9 00	4	2	5,000	.....	10	.....	10	298
8,763	12,480	15 00	9 00	12 00	6 00	1	1	1,050	10	....	10	.....	299
15,800	.....	13 20	12 00	.....	.....	5	1	9,094	20	....	20	.....	300
8,300	18,250	piece	piece	.....	.....	2	3	6,600	12½	....	12½	.....	301
57,736	5,225	18 00	10 50	.....	.....	5	1	7,300	10	....	10	.....	302

RETURNS IN DETAIL

FOUNDRIES AND ROLLING MILLS, BRIDGE AND STRUCTURAL

Office No.	Capital employed including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
303	6,000	300	6,500	.....	20	72	40	100	3,000	3	.....
304	200,000	304	1,720,576	.....	100	1,332	4,200	211,653	.....	482	.....
305	1,260,000	....	.....	.....	.....	700	1,475	.....	.....	.....	.....
306	50,000	300	125,000	.....	.....	300	1,200	8,400	.....	90	.....
307	120,195	300	197,974	.....	1½	476	624	.....	.....	1,203	.....
308	24,000	300	28,000	30	.....	80	154	700	100	15	.....
309	480,000	300	200,000	.....	.....	1,000	1,215	.....	.....	100	.....
310	400,000	230	552,002	12	.....	357	1,864	82,000	38,464	150	.....
311	80,000	297	40,000	.....	12	879	163	.....	.....	35	.....
312	219,331	300	202,933	.....	15	1,019	124	6,200	116,884	120	3
313	50,000	300	50,000	.....	30	200	292	5,000	4,150	30	.....
314	33,375	308	43,121	yes	.....	502	135	1,050	4,794	34	.....
315	6,200	302	10,572	1½	.....	142	78	.....	.....	5	.....
316	575,000	305	917,263	.....	5¼	1,865	8,475	137,500	275,920	574	38
317	12,000	313	11,000	2	.....	74	1,800	600	.....	6	.....
318	142,200	296	156,000	8	.....	.....	.....	6,200	.....	32	.....
319	22,843	312	.....	.....	.....	372	289	.....	.....	6	.....
320	290,000	325	500,000	.....	8	1,517	2,725	9,000	.....	310	.....
321	53,000	300	52,000	38	.....	120	367	5,800	.....	35	.....
322	75,100	300	167,000	67	.....	210	410	6,443	123,605	40	.....
323	28,000	300	43,000	30	.....	125	290	2,000	.....	45	.....
324	200,000	100	130,079	16	.....	332	219	25,000	.....	50	.....
325	11,000	300	9,000	no	no	58	30	.....	.....	5	.....
326	45,118	295	32,936	.....	25	170	202	.....	.....	19	1
327	400,000	300	765,000	13	.....	1,677	1,580	6,400	8,579	254	6
328	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....
329	225,000	304	182,000	5¾	.....	.....	313	6,000	.....	56	.....
330	.....	284	538,792	7	.....	776	1,283	.....	.....	154	.....
331	18,000	310	20,000	no	no	296	200	.....	.....	17	.....
332	10,000	310	5,000	20	.....	42	30	1,200	.....	4	.....
333	40,000	310	53,273	50	.....	254	287	13,000	3,443	35	.....
334	11,000	225	.....	.....	yes	.....	116	.....	.....	3	.....

STOVE MANUFACTURERS, HOT AIR FURNACES

335	200,000	300	210,000	.....	15	480	2,800	1,040	16,200	115	.....
336	99,000	300	157,000	3	.....	269	1,434	3,000	75,000	120	.....
337	.....	282	852,393	3	.....	624	.....	.....	.....	320	30
338	950,000	305	325,000	.....	10	3,785	1,567	3,500	60,000	180	10
339	15,000	300	12,000	no	no	65	60	.....	.....	4	.....
340	35,000	300	74,708	.....	10	126	83	500	.....	28	.....
341	46,000	290	108,000	30	.....	306	528	2,100	.....	48	1
342	.....	300	57,000	yes	.....	317	600	900	.....	27	.....
343	1,000,000	275	2,000,000	no	no	10,000	8,100	150,000	.....	900	.....
344	510,000	283	310,000	11	.....	2,313	3,063	6,583	5,300	225	.....
345	100,000	250	165,686	no	no	1,694	2,173	581	.....	110	.....
346	48,500	300	100,000	no	no	1,300	1,600	2,500	.....	40	.....
347	50,000	300	75,000	10	.....	400	400	9,000	.....	45	1
348	75,000	250	60,000	15	.....	710	1,000	300	.....	35	.....

FROM MANUFACTURERS.

IRON WORKS.—TABLE NO. 9.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
1,675	....	18 00	10 50	.....	.....	1	....	780	10	....	10	.....	303
468,796	.....	15 00	12 00	.....	.....	31	2	45,568	no	no	.....	.....	304
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	305
41,543	.....	24 00	18 00	.....	.....	9	....	10,201	yes	....	yes	.....	306
88,833	.....	19 50	10 50	.....	.....	2	....	.....	8	....	8	.....	307
8,300	.....	18 00	9 00	.....	.....	1	....	900	3	....	3	.....	308
66,208	.....	24 00	15 00	.....	.....	10	1	18,300	4¼	....	4¼	.....	309
115,000	.....	21 50	12 00	.....	.....	8	3	21,900	10	....	.....	10	310
23,000	.....	21 50	13 50	.....	.....	4	....	4,985	15	....	15	.....	311
74,026	1,351	21 50	10 50	.....	.....	9	3	15,159	5	....	5	5	312
7,800	.....	15 00	10 50	.....	.....	4	1	6,800	no	no	.....	.....	313
17,279	.....	.....	.....	.....	.....	1	1	1,176	yes	....	yes	.....	314
2,656	.....	16 00	10 00	.....	.....	1	....	1,000	.....	4	.....	.....	315
424,785	15,835	15 00	10 00	12 00	4 50	28	8	37,205	5	....	5	.....	316
3,000	.....	12 00	4 00	.....	.....	....	....	.....	no	no	.....	.....	317
15,653	.....	19 80	11 10	.....	.....	3	3	7,300	2½	....	2½	2½	318
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	319
200,000	.....	piecew'k	.....	.....	.....	15	4	32,000	.....	....	.....	.....	320
19,949	.....	piecew'k	10 50	.....	.....	2	1	3,000	no	no	.....	.....	321
26,009	.....	21 50	15 00	.....	.....	6	1	6,819	12	....	12	12	322
21,000	.....	18 90	10 50	.....	.....	2	1	4,200	5	....	5	.....	323
35,409	.....	20 00	10 50	.....	.....	4	1	6,385	5	....	5	.....	324
3,650	.....	15 00	12 00	.....	.....	....	....	.....	no	no	.....	.....	325
10,125	both	16 50	.....	.....	.....	1	....	234	no	no	.....	.....	326
148,197	625	16 50	12 00	.....	8 40	32	14	28,944	5	....	5	5	327
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	328
39,282	.....	21 50	12 00	.....	.....	10	2	14,000	2	....	2	.....	329
87,845	.....	.....	.....	.....	.....	5	....	4,098	.....	....	.....	.....	330
7,000	.....	15 00	10 50	.....	.....	2	....	1,440	no	no	.....	.....	331
1,500	.....	10 50	7 50	.....	.....	....	....	.....	no	no	.....	.....	332
15,800	.....	21 50	15 00	.....	.....	3	1	3,620	no	no	.....	.....	333
2,344	.....	18 00	13 50	.....	.....	....	....	.....	10	....	10	.....	334

AND HEATING APPARATUS.—TABLE NO. 10.

94,501	.....	19 50	10 50	.....	.....	1	3	4,820	no	no	.....	.....	335
68,000	.....	18 00	12 00	.....	.....	4	1	13,000	.....	....	.....	.....	336
165,128	7,638	18 00	11 50	9 00	6 00	22	5	13,740	.....	....	.....	.....	337
95,000	3,500	18 00	12 00	.....	8 00	14	5	22,650	8	....	8	8	338
2,500	.....	12 00	.....	.....	.....	1	....	1,200	no	no	.....	.....	339
9,000	.....	18 00	12 00	.....	.....	....	1	500	no	no	.....	.....	340
42,161	468	18 00	12 00	9 00	.....	3	1	3,750	3	....	3	.....	341
18,000	.....	24 00	13 50	.....	.....	2	1	3,380	10	....	10	.....	342
600,000	.....	.....	.....	.....	.....	30	10	.....	no	no	.....	.....	343
127,222	.....	21 50	13 50	.....	.....	18	3	24,183	no	no	.....	.....	344
61,140	.....	.....	.....	.....	.....	8	1	8,470	10	....	10	.....	345
23,600	.....	.....	.....	.....	.....	9	....	10,000	no	no	.....	.....	346
35,000	both	21 50	12 00	.....	.....	1	1	1,800	10	....	10	.....	347
12,000	.....	19 50	15 00	.....	.....	3	1	4,700	no	no	.....	.....	348

RETURNS IN DETAIL

ENGINES, BOILERS AND MACHINERY FACTORIES; ENGINEERS

Office No.	Capital employed including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
349	30,000	313	25,000	25	.....	150	150	1,500	1,100	.....	.....
350	328,000	240	100,980	.....	.....	1,561	2,195	30,000	.....	76	6
351	40,000	320	30,000	no	no	225	300	200	.....	20	1
352	35,700	300	18,000	.....	5	151	298	.....	1,100	10	.....
353	760,000	300	737,000	.....	12	4,500	1,500	20,000	100,000	390	.....
354	60,000	305	75,000	12	.....	340	310	5,000	.....	50	.....
355	26,195	310	39,670	29	.....	315	474	.....	1,943	10	.....
356	100,600	300	170,000	14	.....	253	1,315	45,000	107,000	40	.....
357	2,500	313	65,000	10	.....	89	30	.....	.....	3	1
358	32,000	305	29,116	no	no	84	246	.....	.....	57	.....
359	75,000	313	50,000	25	.....	77	232	.....	.....	6	.....
360	1,000	300	7,000	100	.....	.....	.....	700	.....	5	.....
361	55,000	300	57,000	22½	.....	150	500	500	.....	30	.....
362	80,000	305	63,218	yes	.....	114	426	6,000	.....	25	.....
363	91,177	300	168,869	25	.....	226	1,430	2,391	39,406	40	.....
364	40,000	300	11,780	.....	.....	79	322	1,320	.....	16	.....
365	12,475	305	30,351	24	.....	114	295	445	1,241	19	.....
366	5,000	305	3,000	52	.....	.....	.....	.....	.....	.....	.....
367	190,000	305	.....	.....	yes	.....	.....	.....	.....	100	.....
368	75,000	300	46,371	7	.....	203	592	.....	2,965	20	.....
369	79,239	300	42,380	.....	3½	137	413	.....	18,883	25	.....
370	9,000	305	15,800	.....	yes	50	20	150	.....	10	.....
371	35,000	309	30,000	40	.....	485	320	.....	.....	30	.....
372	20,000	287	6,722	10	.....	14	100	2,000	.....	6	.....
373	23,200	305	81,893	no	no	346	593	.....	7,460	16	.....
374	65,000	305	400,000	.....	.....	.....	.....	.....	.....	225	.....
375	61,342	300	38,447	no	no	240	59	.....	3,282	30	.....
376	60,000	300	38,000	.....	10	288	235	1,500	600	18	.....
377	25,000	300	30,000	20	.....	.....	60	.....	3,000	3	.....
378	187,000	175	70,000	.....	.....	600	1,250	65,000	.....	95	.....
379	50,000	310	20,000	.....	15	200	85	.....	.....	4	.....
380	6,000	313	4,000	10	.....	25	74	.....	250	4	.....
381	478,302	309	251,295	5	.....	3,491	1,295	.....	.....	132	.....
382	124,679	300	91,752	yes	.....	353	471	10,000	.....	80	.....
383	45,000	268	17,536	.....	13	108	125	1,000	.....	14	.....
384	52,899	300	152,000	20	.....	141	166	28,868	7,600	20	.....
385	250,000	305	313,000	5	.....	236	502	3,700	160,000	175	.....
386	4,000	150	10,000	.....	.....	110	15	.....	.....	2	.....
387	30,700	305	11,000	yes	.....	47	.....	1,000	2,440	5	.....
388	100,000	300	100,000	no	no	600	500	.....	.....	20	.....
389	1,000,000	300	2,013,051	5	.....	4,252	9,000	71,000	180,000	440	.....
390	18,000	300	24,000	no	no	.....	10,500	.....	.....	12	.....
391	172,500	292	100,000	10	.....	273	800	450	.....	38	.....
392	43,000	305	38,000	10	.....	542	190	.....	.....	18	.....
393	181,931	305	187,213	36	.....	543	2,004	3,318	34,057	118	.....
394	126,000	300	60,000	.....	6	211	328	.....	.....	33	.....
395	1,302,000	305	468,000	.....	5	1,500	7,945	23,300	60,000	425	.....
396	8,000	300	12,000	no	no	32	160	.....	.....	8	.....
397	74,399	301	46,913	3	.....	456	337	5,000	.....	25	.....
398	15,000	305	30,000	30	.....	27	183	.....	.....	15	.....
399	980,000	305	605,000	5	.....	2,053	6,090	.....	.....	290	.....
400	5,000	300	6,000	no	no	40	38	.....	175	3	.....
401	70,659	302	48,068	10	.....	210	312	.....	6,863	38	.....
402	38,000	300	98,000	20	.....	305	991	4,500	25,000	40	.....
403	30,000	300	16,500	.....	15	105	322	.....	193	14	1

FROM MANUFACTURERS.

AND MACHINE SHOPS.—TABLE No. 11.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	349
34,196	2,385	mo 90 00	mo 45 00	50 00	.....	2	....	1,500	no	no	.....	.....	350
12,000	250	.....	.....	mo	.....	....	1	3,000	.....	....	.....	.....	351
5,000	.....	.....	.....	.....	.....	....	1	700	no	no	.....	.....	352
220,000	.....	15 00	12 00	.....	.....	45	12	60,000	4	....	4	4	353
41,000	.....	18 00	10 50	.....	.....	2	1	4,200	5	....	5	.....	354
4,573	.....	16 00	12 00	.....	.....	2	1	3,001	4	4	4	4	355
37,000	.....	27 00	9 00	.....	.....	3	1	7,500	13	....	13	.....	356
1,800	350	.....	.....	.....	.....	3	1	3,080	10	....	10	.....	357
7,831	.....	16 50	10 50	.....	.....	2	1	2,886	9	....	9	9	358
4,000	.....	21 50	12 00	.....	.....	2	1	5,100	yes	....	yes	yes	359
4,800	.....	21 50	12 00	.....	.....	1	....	1,000	16	....	16	16	360
15,000	.....	.....	.....	.....	.....	3	....	2,800	36	....	36	.....	361
12,960	.....	18 00	12 00	.....	.....	3	....	4,000	no	no	.....	.....	362
21,538	.....	18 00	12 00	.....	.....	8	2	8,930	20	....	20	.....	363
7,293	.....	12 50	.....	.....	.....	2	1	2,700	10	....	10	.....	364
12,080	.....	16 50	10 50	.....	.....	....	....	.....	10	....	10	10	365
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	366
30,000	.....	.....	.....	.....	.....	30	....	.....	.....	....	.....	.....	367
14,596	.....	14 40	9 00	.....	.....	2	....	3,200	no	no	.....	.....	368
14,960	.....	16 20	11 10	.....	.....	3	....	2,664	no	no	.....	.....	369
4,969	.....	18 00	12 00	.....	.....	1	....	750	10	....	10	10	370
15,600	.....	18 00	12 00	.....	.....	2	....	750	10	....	10	.....	371
4,420	.....	24 00	12 00	.....	.....	2	....	2,808	5	....	5	.....	372
12,845	.....	21 50	.....	.....	.....	2	1	7,061	.....	....	.....	.....	373
117,283	.....	21 50	13 50	.....	.....	7	3	16,030	.....	....	.....	.....	374
16,147	.....	21 50	12 00	.....	.....	2	1	2,264	no	no	.....	.....	375
13,714	.....	21 50	12 00	.....	.....	3	....	2,460	no	no	.....	.....	376
1,500	.....	16 50	12 00	.....	.....	3	1	1,600	10	....	10	.....	377
28,000	.....	21 50	12 00	.....	.....	5	3	11,000	no	no	.....	.....	378
5,000	.....	21 50	.....	.....	.....	1	....	1,000	10	....	10	10	379
2,000	.....	12 00	.....	.....	.....	1	....	.....	.....	....	.....	.....	380
76,206	.....	24 00	9 00	.....	.....	12	10	22,182	10	....	10	10	381
32,865	.....	15 00	12 00	.....	.....	5	1	5,876	yes	....	yes	.....	382
9,345	.....	.....	.....	.....	.....	1	1	1,976	7	....	7	.....	383
12,452	.....	17 10	13 20	.....	.....	9	1	7,224	10	....	10	.....	384
101,011	.....	18 00	10 50	.....	.....	9	1	11,875	3	....	3	.....	385
150	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	386
2,811	.....	12 00	.....	.....	.....	1	1	1,130	yes	....	yes	.....	387
14,000	.....	.....	.....	.....	.....	2	1	5,500	no	no	.....	.....	388
275,000	.....	21 50	11 40	.....	.....	65	....	79,864	5	....	5	5	389
10,444	.....	21 50	16 80	.....	.....	....	....	.....	.....	....	.....	.....	390
20,560	.....	18 00	12 00	.....	.....	2	2	5,700	10	....	10	10	391
19,200	.....	16 50	13 50	.....	.....	2	....	4,300	10	....	10	.....	392
71,890	.....	16 80	10 80	.....	.....	9	1	22,265	20	....	20	.....	393
19,000	.....	.....	.....	.....	.....	5	3	.....	no	no	.....	.....	394
195,000	.....	16 00	12 00	.....	.....	18	11	31,000	8	....	8	.....	395
6,500	.....	16 20	.....	.....	.....	....	....	.....	no	no	.....	.....	396
16,852	.....	21 50	12 00	.....	.....	2	....	1,120	15	....	15	15	397
12,000	.....	19 52	14 00	.....	.....	2	....	221	2	....	2	.....	398
201,556	.....	19 44	13 00	.....	.....	....	....	.....	10	....	10	.....	399
2,800	.....	10 80	.....	.....	.....	....	1	50	no	no	.....	.....	400
19,740	.....	15 00	12 00	.....	.....	1	....	600	no	no	.....	.....	401
20,013	.....	25 00	12 00	.....	.....	2	2	4,500	yes	....	yes	.....	402
5,624	364	.....	.....	.....	.....	....	....	.....	3	....	3	.....	403

RETURNS IN DETAIL

ENGINES, BOILERS AND MACHINERY FACTORIES; ENGINEERS

Office No.	Capital employed, including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
404	35,000	296	58,000	5	.....	400	188	.....	.....	20	.....
405	.....	300	147,000	.....	1¼	650	2,288	.....	.....	70	.....
406	.....	300	125,000	.....	25	367	495	3,000	20,000	65	.....
407	175,000	299	120,000	no	no	265	695	.....	.....	60	.....
408	350,000	300	75,298	25	.....	211	1,206	.....	.....	46	4
409	15,000	280	32,850	yes	.....	306	.....	.....	.....	10	.....
410	8,000	310	10,000	.....	20	360	40	200	.....	7	1
411	12,000	300	20,161	25	.....	155	68	.....	2,101	4	.....
412	3,000	260	.....	.....	.....	30	.....	100	.....	8	.....
413	15,000	312	24,141	yes	.....	88	62	1,200	580	9	.....
414	125,000	300	120,000	.....	yes	450	250	5,000	.....	68	3
415	160,000	70	6,000	.....	6	550	70	.....	.....	36	.....
416	18,000	320	12,000	no	no	100	11,000	.....	.....	10	.....
417	46,634	312	6,000	.....	20	141	71	.....	.....	6	.....

METALLIC ROOFING AND

418	4,500	305	5,000	no	no	50	12	.....	.....	4	.....
419	5,000	250	3,000	.....	50	55	8	.....	.....	4	.....
420	30,000	300	21,000	30	.....	88	165	.....	.....	7	.....
421	80,000	200	63,000	yes	.....	200	1,200	5,000	.....	40	6
422	250,000	305	65,000	10	.....	90	650	.....	.....	24	.....
423	10,500	300	35,000	25	.....	87	90	200	.....	8	3
424	40,000	305	70,000	40	.....	210	1,200	3,000	5,000	40	.....
425	79,400	308	80,000	no	no	514	1,546	.....	.....	50	.....
426	10,000	270	15,000	20	.....	60	15	800	.....	5	.....
427	27,460	308	121,056	10	.....	420	431	.....	4,192	55	.....
428	13,200	254	56,513	.....	.....	32	375	2,025	178	35	6
429	9,000	305	15,000	20	.....	40	40	1,000	.....	6	1
430	100,000	306	145,000	15	.....	820	302	.....	.....	38	5
431	100,000	306	120,000	25	.....	266	339	.....	1,000	52	.....
432	330,000	300	673,768	yes	.....	2,654	2,139	7,000	.....	325	.....
433	26,000	313	16,000	yes	.....	50	450	.....	.....	7	.....
434	20,000	300	18,000	25	.....	.....	.....	5,000	.....	18	.....
435	75,000	....	.....	.....	.....	.....	.....	10,000	.....	.....	.....
436	70,000	300	35,000	.....	3	510	500	500	1,000	30	.....
437	35,000	300	21,818	13	.....	52	201	200	250	18	.....
438	70,000	275	55,000	.....	.....	47	245	2,800	.....	32	.....
439	750,000	300	370,000	100	.....	1,004	516	76,500	.....	230	15
440	300,000	315	889,682	10	.....	1,206	747	3,243	72,234	154	.....
441	128,743	250	242,849	3	.....	460	940	4,298	23,519	26	.....
442	15,800	310	15,555	.....	12	123	53	20	2,340	3	.....
443	200,000	305	859,843	1	.....	800	4,411	91,169	90,559	285	46
444	30,000	310	24,695	6	.....	44	39	.....	.....	8	.....
445	10,000	310	30,000	no	no	560	60	.....	.....	.....	.....
446	150,000	300	75,000	.....	.....	.....	100000	.....	.....	35	.....
447	200,000	300	165,000	15	.....	800	1,700	9,000	.....	150	15
448	70,000	278	50,000	no	no	324	50	1,240	.....	22	1
449	27,000	310	67,000	no	no	73	212	.....	5,349	42	.....
450	80,000	300	140,000	yes	.....	336	2,074	.....	.....	120	15
451	28,000	300	33,000	yes	.....	416	275	1,470	.....	20	.....
452	20,000	312	.....	20	.....	200	15,000	200	100	13	40

FROM MANUFACTURERS.

AND MACHINE SHOPS.—TABLE No. 11—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
6,900	.....	16 50	9 00	.....	.....	4	....	2,500	no	no	.....	.....	404
58,522	.....	24 00	15 00	.....	.....	5	1	7,600	12	....	12	.....	405
30,000	.....	18 00	12 00	.....	.....	9	1	.....	.....	....	.....	.....	406
26,580	.....	15 60	10 50	.....	.....	8	2	4,780	no	no	.....	.....	407
26,676	1,350	21 50	12 00	.....	.....	2	4	3,750	10	....	10	.....	408
5,429	.....	.....	.....	.....	.....	1	....	900	no	no	.....	.....	409
6,000	416	15 00	6 00	.....	.....	2	....	1,616	no	no	.....	.....	410
1,450	.....	12 00	10 50	.....	.....	1	1	1,789	14	....	14	14	411
4,500	.....	18 00	15 00	.....	.....	1	....	600	no	no	.....	.....	412
5,191	.....	14 40	4 80	.....	.....	1	....	811	no	no	.....	.....	413
50,700	1,560	20 70	15 00	.....	.....	6	3	9,672	7	....	7	7	414
2,400	.....	.....	.....	.....	.....	1	1	1,200	.....	yes	yes	.....	415
3,840	.....	18 00	10 50	.....	.....	....	1	300	no	no	.....	.....	416
.....	.....	.....	.....	.....	.....	....	....	.....	10	....	10	.....	417

LIGHT IRONWARE.—TABLE No. 12.

3,600	.....	15 00	.....	.....	.....	....	....	.....	.....	....	.....	.....	418
1,800	.....	9 00	.....	.....	.....	....	1	208	.....	yes	.....	.....	419
3,800	.....	15 00	12 00	.....	.....	1	....	600	.....	....	.....	.....	420
15,000	3,500	15 00	12 00	6 60	5 40	2	1	both	.....	....	.....	.....	421
12,500	.....	15 00	10 50	.....	.....	2	....	2,200	no	no	.....	.....	422
3,510	566	15 00	7 20	7 50	.....	1	....	780	.....	....	.....	.....	423
21,000	.....	15 00	12 00	.....	.....	3	1	2,300	50	....	50	.....	424
15,000	.....	16 50	10 50	.....	.....	5	3	4,972	no	no	.....	.....	425
3,105	.....	15 00	12 00	.....	.....	1	1	1,500	5	....	5	.....	426
40,553	.....	15 00	12 00	.....	.....	4	....	6,000	2½	....	2½	.....	427
6,432	1,000	15 00	12 00	6 00	.....	3	....	2,950	no	no	.....	.....	428
3,000	300	15 00	12 00	.....	.....	2	1	1,500	10	....	10	.....	429
24,583	2,409	24 00	12 00	7 50	7 00	2	1	6,000	no	no	no	.....	430
15,469	.....	.....	.....	.....	.....	18	5	11,319	10	....	10	10	431
178,600	.....	21 50	10 80	.....	.....	13	3	27,500	.....	....	.....	.....	432
4,900	.....	21 50	15 00	.....	.....	2	1	2,600	yes	....	.....	.....	433
10,000	.....	.....	.....	.....	.....	....	....	.....	10	....	10	.....	434
.....	.....	.....	.....	.....	.....	4	1	.....	.....	....	.....	.....	435
14,000	.....	15 00	11 10	.....	.....	3	1	1,250	5	....	5	.....	436
9,379	.....	18 00	9 00	.....	.....	2	2	4,515	5	....	5	.....	437
10,482	.....	18 00	12 00	.....	.....	7	....	9,446	no	no	.....	.....	438
175,680	4,626	16 50	12 00	10 80	6 00	33	10	44,576	no	no	.....	.....	439
57,289	.....	21 50	15 00	.....	.....	54	8	68,248	5	....	5	5	440
8,799	.....	15 00	12 00	.....	.....	5	4	9,754	no	no	.....	.....	441
3,395	.....	24 00	12 00	.....	.....	1	1	2,164	no	no	.....	.....	442
115,841	12,022	.....	.....	.....	.....	6	3	10,639	no	no	.....	.....	443
4,932	.....	18 00	7 00	.....	.....	1	....	4,838	no	no	.....	.....	444
.....	.....	.....	.....	.....	.....	2	....	1,500	no	no	.....	.....	445
20,000	.....	18 00	12 00	.....	.....	1	1	2,300	10	....	10	.....	446
61,000	6,000	18 00	12 00	10 50	4 80	4	2	8,000	10	....	10	.....	447
16,611	442	16 50	10 50	.....	.....	....	....	.....	no	no	.....	.....	448
16,688	.....	18 00	10 80	.....	.....	2	....	2,340	no	no	.....	.....	449
57,275	.....	.....	.....	.....	.....	4	....	14,000	no	no	.....	.....	450
11,515	.....	18 00	12 00	.....	.....	2	1	2,996	no	no	.....	.....	451
4,190	both	15 00	12 00	9 00	6 00	....	....	.....	2½	....	2½	.....	452

RETURNS IN DETAIL

WIRE FENCE, WIRE ROPE AND

Office No.	Capital employed including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year. Increased.	Production during year. Decreased.	Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only. Male.	Total No. of employees, wage-earners only. Female.
	$		$	%	%	$	$	$	$		
453	4,500	306	20,000	.....	.....	160	.....	.....	.....	11	.....
454	28,925	300	20,787	2	.....	61	122	.....	5,038	9	.....
455	381,600	300	690,010	16	.....	91	740	18,000	.....	132	.....
456	210,000	300	333,000	.....	11	114	916	.....	71,118	65	.....
457	18,000	305	6,300	20	.....	51	190	.....	3,198	10	.....
458	40,000	300	60,000	no	no	140	70	.....	.....	40	.....
459	7,000	300	25,000	25	.....	.....	12	.....	.....	.....	.....
460	200,000	300	106,908	25	.....	100	170	16,000	185	20	.....
461	50,000	300	147,673	.....	30	36	1,136	.....	17,521	15	.....
462	54,250	200	20,094	.....	yes	102	75	.....	3,404	6	.....
463	1,150,234	305	1,734,497	1	.....	261	706	13,625	45,060	143	22
464	578,500	273	776,231	no	no	5,073	5,468	39,646	.....	310	.....
465	112,458	307	469,755	57	.....	110	788	840	1,665	92	.....
466	27,250	260	71,961	10	.....	143	295	.....	.....	11	1

BRASS AND COPPERWARE FACTORIES AND

467	264,000	313	502,368	19	.....	244	433	18,750	.....	100	.....
468	33,000	156	10,000	.....	.....	.....	346	.....	.....	30	6
469	72,351	300	67,130	.....	15	286	590	1,034	.....	50	10
470	100,000	280	125,000	.....	30	365	378	1,500	.....	57	3
471	10,000	289	26,500	no	no	10	59	300	16,000	10	.....
472	37,252	305	29,327	6	.....	282	248	1,500	.....	28	2
473	50,000	312	56,000	20	.....	383	325	26,000	4,000	30	.....
474	56,651	300	122,961	46	.....	71	442	.....	19,567	75	.....
475	498,423	300	225,000	2½	.....	2,773	2,124	.....	30,000	124	.....
476	133,000	300	217,000	4	.....	.....	.....	3,000	.....	100	.....
477	150,000	300	113,000	.....	20	665	1,400	4,000	71,000	50	5
478	115,632	304	219,864	39	.....	39	148	33,881	6,315	13	.....
479	50,000	300	54,500	yes	.....	.....	200	5,800	8,028	45	.....
480	.....	300	.....	.....	yes	.....	.....	.....	.....	20	.....
481	40,000	305	102,000	no	no	.....	480	.....	.....	16	.....
482	288,409	300	650,000	.....	10	232	592	12,598	.....	200	10
483	127,231	300	190,000	10	.....	399	1,587	3,000	31,326	75	2

SILVER AND PLATEDWARE FACTORIES

484	550,000	293	476,000	.....	2	1,694	360	12,500	7,200	120	21
485	7,559	300	15,160	yes	.....	18	49	.....	.....	7	3
486	253,938	294	278,764	.....	10	679	770	.....	14,281	108	25
487	30,000	300	50,000	.....	5	150	150	4,000	500	21	4
488	288,635	300	166,194	.....	2	1,318	1,029	2,168	15,696	100	10
489	8,000	300	4,000	.....	yes	39	24	.....	.....	6	3
490	18,000	300	38,704	15	.....	39	852	100	.....	13	.....
491	687,192	285	463,618	5	.....	1,180	1,378	10,008	25,265	110	42

FROM MANUFACTURERS.

WIRE CLOTH FACTORIES.—TABLE NO. 13.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
6,315	.....	15 00	.....	.....	.....	....	....	.....	.....	....	.....	.....	453
6,808	.....	.....	.....	.....	.....	....	1	809	yes	....	.....	.....	454
94,665	.....	15 00	12 00	.....	.....	15	7	20,582	10	....	10	.....	455
65,698	.....	20 00	15 00	.....	.....	9	3	12,682	10	....	10	.....	456
8,822	.....	24 00	16 50	.....	.....	4	2	4,423	8	....	.....	8	457
20,000	.....	18 00	12 00	.....	.....	....	1	500	no	no	.....	.....	458
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	459
10,500	.....	15 00	10 50	.....	.....	2	3	5,050	5	....	5	.....	460
6,967	.....	15 00	10 80	.....	.....	4	....	5,160	no	no	.....	.....	461
2,497	.....	16 00	10 50	.....	.....	5	1	2,346	no	no	.....	.....	462
64,357	6,079	8 65	.....	3 18	.....	17	5	17,947	yes	....	yes	yes	463
185,757	.....	13 15	.....	.....	.....	17	9	30,983	7⅔	....	7⅔	7⅔	464
34,981	.....	18 00	12 00	.....	.....	5	6	3,513	10	....	10	10	465
9,248	360	15 00	10 50	.....	.....	2	1	1,950	no	no	.....	.....	466

PLUMBERS' SUPPLIES.—TABLE NO. 14.

65,282	.....	18 00	13 20	.....	.....	8	1	16,520	10	....	10	10	467
10,667	825	15 00	10 50	.....	5 40	2	1	1,350	.....	....	.....	.....	468
20,733	1,917	18 00	10 50	6 00	4 80	4	2	4,008	3	....	3	.....	469
46,942	both	21 50	12 00	.....	6 00	5	4	8,004	no	no	.....	.....	470
9,500	.....	25 80	14 40	.....	.....	....	....	.....	.....	....	.....	.....	471
16,201	728	.....	.....	.....	.....	3	2	4,472	10	....	10	.....	472
15,000	.....	18 00	15 00	.....	.....	2	....	2,500	no	no	.....	.....	473
30,000	.....	.....	12 00	.....	.....	3	1	4,640	40	....	40	.....	474
85,142	.....	24 00	15 00	.....	.....	36	8	29,665	5	....	5	.....	475
75,000	.....	2,150	.....	.....	.....	....	....	.....	10	....	10	.....	476
25,000	1,800	.....	.....	.....	.....	8	3	10,000	no	no	.....	.....	477
6,684	.....	21 50	12 00	.....	.....	3	1	6,525	no	no	.....	.....	478
24,475	.....	.....	.....	.....	.....	2	2	4,800	10	....	10	10	479
.....	.....	.....	.....	.....	.....	....	....	.....	no	no	.....	.....	480
9,995	.....	18 00	.....	.....	.....	2	....	4,000	no	no	.....	.....	481
143,000	both	15 00	11 00	.....	.....	10	11	25,000	10	....	.....	10	482
38,574	both	.....	.....	.....	.....	4	2	16,000	no	no	.....	.....	483

JEWELRY FACTORIES.—TABLE NO. 15.

98,245	both	21 00	12 00	.....	9 00	5	4	16,500	5	....	5	.....	484
8,018	both	.....	.....	.....	.....	....	....	.....	yes	....	.....	.....	485
62,723	both	21 00	9 00	10 00	5 00	7	9	11,102	yes	....	yes	.....	486
12,000	1,300	15 00	5 00	7 00	5 00	1	2	2,600	5	....	5	5	487
76,609	both	21 00	12 00	9 00	4 50	12	8	24,581	.....	....	.....	.....	488
1,930	282	13 00	6 00	6 00	6 00	....	....	.....	.....	....	.....	.....	489
8,537	.....	17 00	.....	.....	.....	....	2	604	5	....	5	.....	490
89,015	13,713	18 00	11 00	8 00	6 50	3	3	16,922	12	....	12	12	491

RETURNS IN DETAIL

WOOLLENS. COTTONS, LINENS AND

Office No.	Capital employed including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year. Increased.	Production during year. Decreased.	Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only. Male.	Total No. of employees, wage-earners only. Female.
	$		$	%	%	$	$	$	$		
492	9,800	225	8,900	10	.....	46	57	.....	4,500	55	25
493	2,000	200	3,100	5	.....	25	30	.....	.....	.....	.....
494	41,000	288	57,000	.....	10	174	750	500	.....	10	25
495	50,000	300	100,000	10	.....	50	200	3,000	.....	30	3
496	100,000	305	80,000	10	.....	300	600	1,500	500	30	10
497	10,500	305	25,211	8	.....	106	140	600	.....	6	2
498	.....	278	350,000	no	no	683	500	.....	.....	80	160
499	20,000	260	45,000	no	no	360	100	2,000	.....	6	6
500	40,000	200	75,000	no	no	200	300	1,500	.....	25	1
501	105,500	280	117,000	no	no	587	1,616	9,000	.....	47	44
502	83,685	349	20,015	45	.....	58	461	.....	.....	6	2
503	15,000	160	4,000	.....	250	135	40	.....	120	14	5
504	.....	36	2,000	.....	yes	10	25	.....	500	2	.....
505	.....	300	6,000	no	no	.....	108	5,000	.....	12	.....
506	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....
507	8,000	200	5,000	no	no	104	75	100	.....	2	.....
508	1,000	50	108	.....	25	28	.....	.....	.....	.....	.....
509	1,000,000	300	1,000,000	.....	10	8,200	2,000	35,000	15,000	350	150
510	10,000	300	20,000	10	.....	70	100	500	.....	5	.....
511	5,000	250	.....	no	no	77	55	.....	.....	3	3
512	124,400	250	380,000	25	.....	20	16	32,000	58,700	134	132
513	.....	300	75,000	15	.....	184	600	2,000	.....	25	17
514	6,000	300	20,000	.....	5	290	112	200	.....	2	2
515	4,000	290	7,000	.....	.....	46	15	.....	.....	3	1
516	25,000	300	35,000	no	no	54	90	1,800	.....	11	.....
517	120,000	270	75,000	.....	40	450	850	5,000	4,600	20	15
518	15,000	300	25,000	10	.....	210	158	.....	145	4	16
519	36,900	235	24,000	.....	20	90	350	400	.....	8	24
520	2,000,000	304	1,880,000	3	.....	105	2,280	120,000	.....	626	446
521	800,000	303	677,000	10	.....	42	613	120,000	.....	130	225
522	60,000	305	30,000	no	no	555	600	10,000	.....	12	11
523	75,000	300	70,000	.....	.....	1,200	both	5,000	.....	26	21
524	32,000	300	75,000	.....	20	140	500	.....	.....	22	28
525	6,000	120	3,000	.....	45	50	95	.....	.....	10	.....
426	20,000	300	5,000	no	no	60	.....	.....	.....	4	.....
527	65,319	310	339,924	16	.....	936	954	.....	.....	143	both
528	34,800	290	46,000	.....	5	113	320	738	25,206	9	8
529	6,000	119	8,000	yes	.....	35	41	78	.....	18	22
530	54,000	280	120,000	25	.....	86	511	1,030	5,925	.....	15
531	40,000	250	15,750	.....	30	100	500	.....	.....	6	6
532	165,000	300	196,787	4	.....	878	1,996	20,000	21,577	75	50
533	.....	....	.....	.....	.....	18	.....	.....	.....	.....	.....

KNITTED GOODS FACTORIES

534	140,694	291	221,059	16$\frac{5}{10}$	.....	473	2,366	4,403	29,957	36	80
535	661,300	300	692,400	4$\frac{1}{2}$	.....	1,460	5,525	11,300	45,300	95	230
536	700,000	280	800,000	5	.....	3,600	.....	30,000	65,000	275	275
537	65,850	305	59,560	7	.....	344	1,183	.....	1,112	3	63
538	10,000	313	45,000	no	no	47	44	185	100	.....	4
539	150,000	300	200,000	no	no	1,200	1,000	3,000	90,000	80	50
540	75,000	300	126,000	4	.....	200	900	20,000	.....	6	60
541	200,000	284	287,000	.....	7	1,300	130	8,000	.....	65	85

FROM MANUFACTURERS.

YARNS.—TABLE No. 16.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
5,000	both	12 00	8 00	2 00	.....	1	....	600	no	no	.....	.....	492
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	493
7,000	5,000	16 00	12 00	10 00	5 00	1	1	1,320	no	no	.....	.....	494
12,000	both	13 50	12 00	7 50	.....	....	....	.....	10	....	10	.....	495
10,000	4,500	15 00	12 00	10 50	7 50	1	1	3,000	yes	....	.....	.....	496
3,900	700	14 00	9 00	7 75	6 00	....	....	.....	.....	....	.....	.....	497
25,000	34,000	12 00	10 00	7 50	5 40	2	1	3,738	no	no	.... ..	.....	498
3,120	1,170	12 00	9 00	6 00	4 00	1	....	700	no	no	.....	.....	499
14,000	300	12 00	9 00	.....	.....	....	1	300	no	no	.....	.....	500
31,428	both	16 50	9 00	8 00	4 20	3	1	.....	7	....	7	.....	501
4,069	both	.....	.....	.....	.....	3	2	5,466	.....	....	.....	.....	502
4,000	325	10 50	9 00	7 50	.....	....	....	.....	no	no	.....	.....	503
350	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	504
9,000	.....	9 00	.....	.....	.....	....	....	780	no	no	.....	.....	505
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	506
1,600	.....	.....	.....	.....	.....	....	....	.....	no	....	.....	.....	507
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	508
150,000	50,000	18 00	12 00	15 00	8 00	27	7	47,000	yes	....	yes	.....	509
2,500	.....	10 50	.....	.....	.....	....	1	500	10	....	10	.....	510
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	511
97,181	both	19 00	12 00	9 00	6 00	6	3	9,009	4	....	4	.....	512
12,000	3,000	15 00	10 80	9 00	6 00	....	....	.....	5	....	5	.....	513
750	1,000	15 00	.....	10 00	.....	1	....	1,300	2	....	2	.....	514
1,300	290	.....	9 00	.....	6 00	....	....	.....	.....	....	.....	.....	515
5,675	.....	13 00	13 00	.....	.....	....	....	400	yes	....	.....	.....	516
11,000	4,500	18 00	10 50	7 50	4 80	3	....	3,800	5	....	5	.....	517
900	2,000	.....	.....	.....	.....	2	1	2,300	no	no	.....	.....	518
.....	.....	.....	.....	.....	.....	....	....	.....	no	no	.....	.....	519
282,168	134642	.....	8 67	.....	5 81	10	1	9,260	no	no	.....	.....	520
66,685	81,504	12 75	8 75	7 75	5 00	4	1	4,850	no	no	.....	.....	521
4,000	2,000	12 00	9 60	6 60	3 60	1	1	1,800	no	no	.....	.....	522
15,000	both	15 00	9 00	.....	.....	2	....	3,000	7	....	7	.....	523
10,500	7,500	9 00	.....	5 40	.....	1	....	1,800	33	....	33	.....	524
1,750	.....	15 00	10 50	.....	.....	....	....	.....	no	no	.....	.....	525
1,400	.....	9 00	6 00	.....	.....	....	....	.....	.....	....	.....	.....	526
51,777	both	18 00	9 00	9 00	6 00	4	2	5,484	6	....	6	.....	427
4,600	1,915	21 50	9 00	6 00	4 50	2	1	2,200	yes	....	yes	.....	528
4,962	246	12 00	10 00	6 00	.....	....	....	.....	10	....	10	.....	529
.....	5,936	.....	.....	12 00	7 00	4	2	7,300	17	....	17	.....	530
3,826	both	.....	.....	.....	.....	3	1	2,700	5	....	5	5	531
56,140	both	18 00	12 00	9 00	6 00	8	1	13,000	20	....	20	.....	532
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	533

AND WOMEN'S UNDERWEAR.—TABLE No. 17.

16,747	20,469	15 00	7 50	11 00	4 50	3	2	6,658	14	....	14	.....	534
47,500	122000	14 40	10 50	9 00	6 00	3	2	5,980	no	no	.....	.....	535
241,012	both	.....	.....	.....	.....	5	5	.....	yes	yes	.....	.....	536
1,547	11,324	.....	.....	.....	.....	2	2	2,406	.....	....	.....	.....	537
.....	693	.....	.....	4 50	3 90	....	....	.....	no	no	.....	.....	538
30,000	20,000	15 00	9 00	9 00	6 00	2	1	4,000	no	no	.....	.....	539
4,500	15,000	18 10	12 00	9 00	6 00	3	1	4,000	8	....	8	8	540
28,000	18,000	15 00	12 00	12 00	7 50	3	3	10,000	7½	....	7½	.....	541

RETURNS IN DETAIL

KNITTED GOODS FACTORIES AND

Office No.	Capital employed, including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
542	1,500,000	313	2,400,000	no	no	80,421	.....	.....	.....	275	41
543	26,500	290	31,000	no	no	189	359	.....	.....	4	30
544	75,000	300	82,000	2	.....	161	152	.....	4,398	17	17
545	100,000	280	130,000	75	.....	668	1,571	50,000	101,642	35	65
546	15,000	300	35,000	300	.....	2,000	400	300	.....	4	10
547	140,000	300	310,000	10	.....	832	583	15,000	.....	55	145
548	100,000	300	65,163	yes	.....	230	980	6,000	.....	20	5
549	44,000	300	68,163	yes	.....	.....	180	900	.....	13	24
550	6,398,082	284	4,071,633	5	.....	11,540	7,587	81,000	386,176	500	1,900
551	50,000	300	90,000	25	.....	89	637	700	67,000	16	38
552	42,000	300	69,000	.....	12	644	550	.....	1,250	11	18

CLOTHING FACTORIES, MENS' AND WOMEN'S

553	100,000	295	175,000	.....	20	197	1,988	.....	27,000	30	38
554	45,000	275	80,454	.....	3½	283	181	.....	5,056	32	36
555	.....	305	.....	yes	.....	.....	.....	.....	.....	.....	.....
556	40,000	312	56,000	.....	8	127	297	.....	.....	2	10
557	25,000	300	60,000	no	no	332	400	.....	.....	5	30
558	12,000	294	50,200	yes	.....	23	200	700	4,300	4	50
559	150,000	305	185,000	.....	2½	1,215	1,024	.....	.....	18	120
560	100,000	300	.....	.....	.....	439	867	.....	.....	50	30
561	40,000	275	180,000	.....	yes	.....	400	.....	.....	.....	100
562	100,000	300	93,159	.....	14	281	126	5,000	.....	41	38
563	40,000	300	100,000	no	no	166	230	.....	.....	2	27
564	10,000	300	15,000	.....	15	.....	74	300	.....	2	7
565	28,000	295	100,000	no	no	210	95	.....	.....	13	85
566	50,000	300	25,000	.....	.....	93	758	.....	7,897	5	14
567	40,000	300	235,000	7½	.....	165	.....	13,500	.....	10	85
568	150,000	300	353,900	.....	.....	.....	2,300	.....	.....	20	180
569	211,600	310	377,599	yes	.....	159	1,709	1,599	.....	100	100
570	40,000	300	21,000	no	no	290	369	.....	.....	25	100
571	100,000	250	150,000	5	.....	1,378	544	300	1,486	40	30
572	31,000	250	125,000	no	no	80	852	1,150	.....	20	20
573	.....	225	60,000	no	no	.....	.....	.....	1,800	9	14
574	75,000	275	150,000	.....	yes	358	1,180	.....	2,300	15	60
575	56,500	313	225,000	5	.....	800	1,200	7,000	.....	20	85

BOOT AND SHOE MANUFACTURERS,

576	100,000	300	111,092	25	.....	218	1,310	300	1,800	28	15
577	100,000	300	250,000	no	no	400	600	.....	.....	70	20
578	24,000	300	150,000	no	no	100	300	.....	.....	40	20
579	50,000	285	58,000	no	no	128	800	600	26,800	19	8
580	569,718	265	1,153,463	.....	16	1,427	1,041	19,155	53,348	222	153
581	175,000	313	500,000	15	.....	80	1,700	2,500	.....	110	15
582	210,000	277	229,900	17	.....	541	320	.....	13,500	18	50
583	3,000	313	6,000	no	no	24	26	.....	.....	2	1
584	82,000	290	171,500	4	.....	327	789	3,000	1,539	57	18
585	50,000	300	70,000	no	no	250	800	10,000	.....	28	1

FROM MANUFACTURERS.

WOMEN'S UNDERWEAR.—TABLE No. 17.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
143,687	11,953	17 00	18 00	.....	.....	11	1	.....	no	no	.....	.....	542
2,500	6,516	.....	.....	.....	.....	....	1	175	no	no	.....	.....	543
12,175	both	.....	.....	.....	.....	....	....	.....	yes	....	.....	.....	544
29,819	both	15 00	10 50	7 50	6 00	3	1	3,933	yes	....	.....	.....	545
4,000	4,000	.....	.....	.....	.....	2	1	2,000	10	....	10	10	546
66,800	both	12 00	9 00	8 50	6 00	2	....	3,700	10	....	10	.....	547
7,589	1,560	15 00	9 00	9 90	6 00	1	1	9,500	yes	....	yes	yes	548
11,918	both	16 50	10 50	12 00	6 00	....	....	.....	.....	....	.....	.....	549
343,000	559000	.....	.....	.....	.....	30	20	45,000	4	....	4	4	550
7,397	10,657	10 00	6 00	7 50	5 00	1	1	1,644	no	no	.....	.....	551
5,400	5,600	16 50	12 00	12 00	9 00	2	1	4,000	no	no	.....	.....	552

WHITEWEAR, MILLINERY.—TABLE No. 18.

9,700	8,330	12 00	6 00	9 00	5 00	3	3	6,000	no	no	.....	.....	553
18,225	12,840	21 00	4 00	10 00	3 50	7	5	9,291	10	....	10	10	554
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	555
1,170	2,537	15 00	7 50	9 00	6 00	2	....	2,624	5	....	5	.....	556
3,000	7,500	.....	.....	.....	.....	3	....	2,500	no	no	.....	.....	557
1,000	9,000	.....	.....	.....	.....	3	....	4,000	.....	....	.....	.....	558
49,643	both	.....	.....	.....	.....	10	9	18,552	.....	10	10	.....	559
.....	.....	.....	.....	.....	.....	8	4	.....	no	no	.....	.....	560
.....	20,000	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	561
24,739	12,369	.....	.....	.....	.....	3	1	4,896	no	no	.....	.....	562
1,600	8,500	.....	.....	.....	.....	13	2	22,900	no	no	.....	.....	563
3,200	both	18 00	7 50	10 00	6 00	1	....	1,000	.....	....	.....	.....	564
8,629	37,606	16 50	10 50	10 50	6 00	2	....	3,000	½	....	¾	.....	565
3,046	1,967	20 00	12 00	6 00	5 40	1	1	2,548	.....	....	.....	.....	566
9,400	27,000	15 00	10 00	12 00	5 00	1	....	875	5	....	5	5	567
74,714	both	.....	10 00	.....	9 00	5	3	13,000	no	no	.....	.....	568
124,371	both	.....	.....	.....	.....	7	7	28,536	yes	....	.....	yes	569
4,600	both	14 00	.....	10 00	.....	10	....	4,800	no	no	.....	.....	570
43,299	both	pcework	.....	.....	.....	2	2	4,500	10	....	10	.....	571
8,055	5,034	12 00	9 00	7 50	6 00	5	2	8,600	no	no	.....	.....	572
5,000	5,000	12 00	8 00	9 00	6 00	4	1	5,050	yes	....	yes	yes	573
10,400	24,000	pcework	.....	.....	.....	1	5	3,700	.....	yes	yes	.....	574
10,000	35,000	.....	.....	.....	.....	15	2	20,000	.....	....	.....	.....	575

FELT FOOTWEAR.—TABLE No. 19.

19,700	both	piecew'k	10 00	piece	6 00	1	2	2,300	3	....	3	3	576
30,000	5,000	13 50	10 50	9 00	6 00	1	1	3,500	no	no	.....	.....	577
16,000	8,000	18 00	10 00	15 00	6 00	2	1	2,150	no	no	.....	.....	578
7,480	both	12 00	10 50	7 50	6 00	2	....	3,000	no	no	.....	.....	579
120,137	48,577	18 00	12 00	10 20	7 50	16	5	19,341	2	....	2	2	580
70,000	10,000	25 00	10 00	9 00	5 00	4	3	6,000	20	....	20	.....	581
28,507	both	.....	.....	.....	.....	3	1	6,950	yes	....	yes	yes	582
700	200	10 00	.....	.....	.....	....	....	.....	no	no	.....	.....	583
27,200	2,200	15 00	10 50	9 00	4 50	5	....	7,700	28	....	28	28	584
12,000	300	.....	.....	.....	.....	3	....	3,500	5	....	5	.....	585

RETURNS IN DETAIL

Boot and Shoe Manufacturers

Office No.	Capital employed including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
586	25,000	300	48,000	20	.....	800	350	2,000	.....	10	5
587	1,000	305	600	.....	10	60	.....	.....	.....	3	.....
588	500,000	260	1,250,000	no	no	1,000	1,100	.....	2,500	200	130
589	149,800	280	323,450	.....	10	1,028	1,688	.....	.....	84	51
590	40,000	240	30,000	.....	.....	200	220	3,500	.....	11	.....
591	71,535	300	101,721	10	.....	56	523	6,659	9,295	25	44
592	100,000	280	150,000	.....	.....	212	635	.....	.....	55	30
593	50,000	297	75,000	.....	yes	.....	1,150	40,000	.....	38	12
594	57,212	300	114,400	9	.....	348	378	1,200	72,000	45	40
595	58,000	300	78,000	18	.....	90	825	800	.....	30	7

Fur Manufacturers, Dressers and Dyers;

596	8,000	305	10,000	no	no	25	25	.....	.....	1	.....
597	35,000	305	40,000	15	.....	42	400	800	.....	8	14
598	50,000	300	175,000	10	.....	485	395	.....	.....	85	40
599	30,000	308	60,000	.....	6	19	288	.....	.....	5	4
600	50,000	280	60,000	.....	20	325	278	.....	.....	7	30

Tanners, Harness and Leather

601	58,736	275	67,200	.....	8	130	723	1,000	.....	12	.....
602	.....	310	.....	no	no	685	2,796	500	.....	50	5
603	739,000	300	1,077,074	.....	16	1,211	3,901	27,863	.....	175	.....
604	826,000	313	92,000	.....	7	1,097	2,456	15,400	.....	100	.....
605	75,000	300	80,614	.....	31	165	949	700	.....	15	.....
606	10,000	305	20,000	no	no	20	42	.....	.....	3	.....
607	1,200,000	310	1,270,000	.....	23	3,076	7,275	12,000	32,500	245	.....
608	75,000	280	72,700	7	.....	430	1,043	600	700	55	2
609	35,000	305	75,000	no	no	75	23	.....	.....	24	24
610	200,000	280	680,500	10⅓	.....	1,413	2,777	10,000	13,095	100	.....
611	27,000	276	52,203	.....	12½	60	181	9,000	2,291	11	19
612	40,000	300	75,000	10	.....	589	522	.....	7,480	30	8
613	35,000	275	59,000	25	.....	40	150	.....	.....	10	15
614	5,000	305	20,000	.....	25	30	30	.....	13,064	3	.....
615	10,000	300	30,000	no	no	60	90	500	.....	4	3
616	250,000	300	350,000	50	.....	92	1,233	.....	36,900	45	.....
617	375,000	300	510,000	.....	10	2,500	600	.....	.....	270	80
618	3,000	300	8,000	.....	10	66	18	.....	.....	6	3
619	30,829	295	36,612	.....	23	171	206	600	.....	7	.....
620	7,000	300	1,500	.....	10	25	18	.....	.....	3	.....
621	40,000	280	45,000	no	no	163	226	.....	3,760	18	.....
622	50,000	300	100,000	.....	25	500	500	.....	.....	20	2
623	48,000	300	84,000	no	no	250	417	1,500	3,121	12	.....
624	6,500	300	.....	no	no	35	98	.....	.....	2	.....
625	55,000	310	50,000	.....	20	417	349	.....	.....	20	.....
626	110,000	303	121,266	10	.....	757	1,020	1,120	5,766	25	5
627	7,000	300	1,500	.....	10	25	18	.....	.....	3	.....

FROM MANUFACTURERS.

FELT FOOTWEAR—TABLE NO. 19.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%		%	
15,000	2,500	20 00	.....	10 00	.....	5	....	4,000	10	....	10	10	586
400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	587
102,000	45,000	15 00	10 80	9 00	6 60	25	15	28,000	no	no	.....	.....	588
52,453	24,742	.....	.....	.....	.....	11	2	16,044	no	no	.....	.....	589
4,480	.....	.....	12 00	11 00	.....	....	....	.....	.....	....	.....	.....	590
14,500	16,000	24 00	12 00	12 00	8 40	5	4	7,200	no	no	.....	.....	591
28,470	15,530	.....	.....	.....	.....	2	6	.....	.....	....	.....	.....	592
17,365	both	15 00	11 00	10 00	7 50	....	....	.....	5	....	5	.....	593
30,018	both	piece wk	.....	.....	.....	5	3	7,644	yes	....	yes	.....	594
13,500	2,600	15 00	6 00	10 50	6 00	2	....	4,500	yes	....	yes	.....	595

HAT AND CAP FACTORIES.—TABLE NO 20.

.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	596
3,000	3,000	.....	.....	.....	.....	3	....	3,900	.....	....	.....	.....	597
.....	.....	18 00	12 00	9 00	.....	5	2	.....	yes	....	.....	.....	598
3,725	both	15 00	8 00	10 00	8 00	....	1	470	no	no	.....	.....	599
.....	.....	17 00	10 00	12 00	4 00	2	1	3,000	no	no	.....	.....	600

GOODS FACTORIES.—TABLE NO. 21.

5,013	.....	11 00	9 00	.....	....	....	....	.....	no	no	.....	.....	601
22,131	1,217	18 00	13 00	15 00	9 00	5	2	16,500	no	no	.....	.....	602
91,330	.....	15 00	10 00	.....	....	5	2	3,224	.....	....	.....	.....	603
51,837	.....	.....	.....	.....	....	2	3	8,136	no	no	.....	.....	604
9,429	.....	18 00	12 00	.....	....	1	....	2,500	no	no	.....	.....	605
1,200	.....	.....	.....	.....	....	....	....	.....	no	no	.....	.....	606
137,472	.....	.....	.....	.....	....	14	3	27,240	.....	....	.....	.....	607
25,400	600	16 50	10 00	.....	6 00	3	2	5,000	no	no	.....	.....	608
15,000	both	15 00	6 00	7 00	5 00	4	2	6,500	no	no	.....	.....	609
63,621	.....	22 00	10 50	.....	....	1	1	1,660	13½	....	13½	.....	610
8,998	6,921	18 00	10 00	9 00	4 50	3	1	4,742	no	no	.....	.....	611
16,500	3,500	16 00	12 00	12 00	7 20	4	1	5,159	.....	....	.....	.....	612
8,600	both	16 50	12 00	12 00	6 00	....	....	.....	yes	....	yes	.....	613
1,449	.....	16 00	12 00	.....	....	....	....	.....	.....	19	19	.....	614
2,500	1,750	15 00	.....	12 00	....	1	....	750	no	no	.....	.....	615
28,924	.....	21 50	12 00	.....	....	3	....	7,450	no	no	.....	.....	616
85,000	35,000	17 50	8 40	9 00	5 40	3	4	7,000	5	....	5	5	617
2,800	700	.....	9 00	.....	5 00	....	....	.....	no	no	.....	.....	618
3,412	.....	15 00	10 00	.....	....	1	....	234	no	no	.....	.....	619
1,200	1,050	8 00	.....	.....	....	....	....	.....	.....	....	.....	.....	620
8,496	.....	15 00	9 00	.....	....	1	1	2,000	yes	....	yes	.....	621
6,000	1,000	15 00	11 00	9 00	5 00	....	1	73	10	....	10	.....	622
8,500	.....	18 00	13 00	.....	....	....	1	500	no	no	.....	.....	623
.....	.....	.....	.....	.....	....	....	....	.....	.....	....	.....	.....	624
11,326	.....	12 00	.....	.....	....	6	2	5,510	5	....	5	5	625
12,984	345	15 00	9 00	7 00	....	2	1	1,962	8	....	8	.....	626
1,200	.....	17 50	8 00	.....	....	....	....	.....	.....	....	.....	.....	627

RETURNS IN DETAIL

FLOUR AND FEED MILLS; CEREAL

Office No.	Capital employed including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	$	%	%	$	$	$		
628	15,000	150	12,000	.....	.....	53	100	800	.....	8	.....
629	42,000	300	297,338	no	no	236	1,530	.....	2,363	9	1
630	8,000	275	10,775	15	.....	125	175	650	.....	2	.....
631	35,000	290	108,000	.....	15	148	380	450	.....	15	.....
632	5,000	305	.....	.....	.....	40	25	.....	.....	2	.....
633	65,000	300	182,363	.....	.....	280	787	.....	.....	13	2
634	20,000	300	46,600	.....	3	217	288	.....	.....	4	.....
635	25,000	305	42,000	10	.....	216	225	.....	.....	3	.....
636	250,000	300	600,000	.....	14	400	2,400	.....	.....	40	4
637	18,000	305	60,000	yes	.....	51	325	200	.....	4	.....
638	15,000	300	40,000	.....	.....	40	200	.....	.....	3	.....
639	20,000	300	50,000	yes	.....	100	350	200	.....	2	.....
640	29,000	290	96,422	.....	30	283	381	.....	839	7	.....
641	35,000	300	102,508	.....	32	330	577	2,571	4,183	7	.....
642	20,000	305	30,000	yes	.....	125	180	766	.....	3	.....
643	12,000	305	58,058	no	no	49	.....	.....	.....	2	.....
644	15,000	300	.....	.....	40	98	.....	110	.....	3	.....
645	50,000	175	.....	no	no	300	700	.....	.....	16	.....
646	110,000	305	300,000	.....	yes	550	1,750	11,000	500	22	.....
647	6,000	300	.....	no	no	35	.....	.....	.....	6	.....
648	6,500	305	22,684	8½	.....	51	99	500	225	1	.....
649	6,000	300	.....	.....	.....	55	36	.....	.....	1	.....
650	8,000	200	.....	.....	.....	103	1,500	.....	.....	2	.....
651	30,000	305	220,000	no	no	146	470	.....	3,980	8	.....
652	60,000	365	300,000	20	.....	250	500	.....	.....	15	.....
653	75,000	300	50,000	no	no	250	1,200	1,000	.....	6	.....
654	250,000	300	93,035	.....	.....	1,103	2,425	.....	.....	80	.....
655	30,000	253	16,000	.....	5	140	192	.....	2,400	4	.....
656	1,200	100	.....	.....	.....	.....	.....	.....	.....	.....	.....
657	10,000	300	60,000	no	no	365	300	.....	100	3	.....
658	10,000	300	22,000	10	.....	94	150	.....	.....	5	.....
659	9,000	310	13,000	yes	.....	200	80	125	.....	2	.....
660	10,000	310	.....	no	no	136	110	400	.....	3	.....
661	50,000	300	106,037	.....	9	702	1,066	.....	3,450	10	.....
662	60,000	310	85,250	no	no	480	390	100	.....	6	.....
663	20,000	310	35,000	.....	.....	200	250	600	.....	2	.....
664	8,000	200	6,000	25	.....	25	104	50	.....	2	.....
665	16,000	300	35,000	no	no	53	350	200	350	3	.....
666	70,000	300	2,000,000	15	.....	1,924	4,555	100,000	.....	65	.....
667	150,000	300	306,000	no	no	425	700	.....	.....	25	.....
668	1,400	200	15,000	no	no	156	200	100	.....	4	1
669	86,500	305	205,000	.....	34	465	280	1,540	13,425	13	.....
670	18,000	310	12,000	.....	10	60	185	.....	.....	2	.....
671	30,000	270	65,000	20	.....	210	380	.....	.....	3	.....
672	18,000	307	70,080	10	.....	92	130	440	.....	3	.....
673	35,000	300	250,000	no	no	240	450	1,000	500	6	.....
674	65,200	310	200,000	.....	5	1,500	1,620	.....	7,000	45	.....
675	40,000	300	156,379	yes	.....	364	504	400	.....	8	.....
676	6,000	312	.....	.....	.....	72	52	.....	.....	1	.....
677	6,500	....	.....	no	no	40	65	.....	.....	.....	.....
678	37,500	310	100,000	yes	.....	125	150	1,500	.....	7	.....
679	4,254,600	300	8,219,662	29	.....	8,212	29,900	.....	184,691	260	.....
680	40,000	306	82,001	.....	20	198	842	.....	4,337	5	1
681	28,000	310	75,000	no	no	260	338	1,400	.....	5	.....

FROM MANUFACTURERS.

FOOD FACTORIES.—TABLE No. 22.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
2,500	.....	18 00	9 90	.....	.....	....	....	.....	.....	....	.....	.....	628
5,849	750	15 00	10 00	15 00	.....	1	....	3,200	no	no	.....	.....	629
960	.....	9 00	.....	.....	.....	....	....	.....	no	no	.....	.....	630
5,900	.....	16 50	9 90	.....	.....	1	1	1,450	.....	....	.....	.....	631
1,000	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	632
3,000	800	.....	.....	.....	.....	3	2	4,000	.....	....	.....	.....	633
2,200	1,500	10 00	.....	.....	.....	....	....	.....	no	no	.....	.....	634
1,800	.....	12 00	9 00	.....	.....	....	....	.....	.....	....	.....	.....	635
25,500	1,400	18 00	12 00	9 00	.....	3	4	6,500	no	no	.....	.....	636
2,100	.....	.....	.....	.....	.....	....	....	.....	no	no	.....	.....	637
1,500	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	638
1,100	.....	12 00	10 50	.....	.....	....	1	3,000	no	no	.....	.....	639
4,295	.....	17 00	12 00	.....	.....	2	1	2,436	no	no	.....	.....	640
3,878	.....	14 00	12 00	.....	.....	2	1	3,328	9	....	9	9	641
2,000	.....	.....	.....	.....	.....	....	....	.....	no	no	.....	.....	642
985	.....	.....	.....	.....	.....	....	....	.....	no	no	.....	.....	643
1,500	.....	10 50	9 00	.....	.....	....	....	.....	10	....	10	.....	644
.....	.....	15 00	10 00	.....	.....	....	1	225	yes	....	yes	.....	645
12,000	.....	15 00	10 20	.....	.....	4	....	3,600	yes	....	yes	yes	646
950	.....	.....	.....	.....	.....	....	....	.....	yes	....	yes	.....	647
734	.....	13 50	.....	.....	.....	....	....	.....	no	no	.....	.....	648
450	.....	9 00	.....	.....	.....	....	....	.....	yes	....	yes	.....	649
900	.....	.....	12 00	.....	.....	....	....	.....	.....	....	.....	.....	650
6,502	.....	16 80	12 60	.....	.....	1	1	1,840	yes	....	yes	.....	651
8,000	.....	21 50	12 00	.....	.....	2	....	2,000	10	....	10	10	652
3,600	.....	13 50	9 00	.....	.....	....	1	420	no	no	.....	.....	653
36,000	.....	10 50	.....	.....	.....	1	2	1,500	10	....	10	.....	654
2,400	.....	.....	.....	.....	.....	....	....	.....	10	....	10	.....	655
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	656
1,800	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	657
3,000	.....	10 00	7 50	.....	.....	....	....	.....	no	no	.....	.....	658
.....	.....	.....	.....	.....	.....	....	....	.....	yes	....	yes	.....	659
900	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	660
6,379	.....	19 00	12 60	.....	.....	2	....	2,700	15	....	15	.....	661
3,240	.....	18 00	10 50	.....	.....	1	....	1,000	5	....	5	.....	662
1,350	.....	12 00	9 00	.....	.....	....	....	.....	no	no	.....	.....	663
1,000	.....	15 00	10 50	.....	.....	....	....	.....	.....	....	.....	.....	664
1,355	.....	13 50	9 60	.....	.....	....	....	.....	no	no	.....	.....	665
48,750	.....	21 50	10 50	.....	.....	7	12	both	10	....	10	10	666
13,000	.....	18 00	12 00	.....	.....	3	3	5,872	10	....	10	10	667
2,500	200	15 00	10 50	.....	.....	1	1	700	10	....	10	.....	668
8,580	.....	13 80	12 00	.....	.....	3	1	4,100	no	no	.....	.....	669
1,200	.....	6 00	.....	.....	.....	....	....	.....	no	no	.....	.....	670
1,620	.....	12 00	9 00	.....	.....	....	....	.....	10	....	10	.....	671
1,290	.....	.....	.....	.....	.....	....	1	425	no	no	.....	.....	672
4,000	.....	15 00	12 00	.....	.....	....	1	400	no	no	.....	.....	673
32,850	.....	21 50	12 00	.....	.....	5	2	12,030	10	....	10	10	674
4,736	.....	18 00	12 00	.....	.....	2	1	2,600	yes	....	yes	.....	675
520	.....	10 50	.....	.....	.....	....	....	.....	.....	....	.....	.....	676
.....	.....	12 00	.....	.....	.....	....	....	.....	.....	....	.....	.....	677
3,150	.....	15 00	6 00	.....	.....	....	....	.....	.....	yes	yes	.....	678
201,795	.....	20 00	15 00	.....	.....	16	....	28,800	5	....	5	.....	679
3,151	300	13 80	9 00	.....	.....	....	....	.....	15	....	15	.....	680
2,828	.....	15 00	12 00	.....	.....	....	....	.....	5	....	5	.....	681

RETURNS IN DETAIL

FLOUR AND FEED MILLS: CEREAL

Office No.	Capital employed, including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
682	40,000	306	78,000	.....	25	142	712	12,000	3,482	5	1
683	200,000	306	500,000	yes	.....	1,400	2,600	.....	.....	14	4
684	8,000	310	35,000	no	no	43	105	.....	.....	1	.....
685	14,000	300	39,453	.....	1½	125	224	900	2,017	4	.....
686	25,000	250	30,000	no	no	45	44	150	.....	2	.....
687	300,000	300	700,000	no	no	1,600	3,500	10,000	.....	40	10
688	10,000	306	31,200	yes	.....	140	200	300	450	2	.....
689	10,000	306	.....	no	no	84	62	.....	.....	1	.....
690	4,000	300	2,500	no	no	45	41	.....	110	1	.....
691	25,000	265	35,000	.....	.....	261	255	400	.....	3	.....
692	100,000	302	172,591	8	.....	591	690	245	606	15	.....
693	30,000	200	37,000	no	no	150	180	1,500	.....	5	.....
694	70,000	300	125,000	no	no	827	640	1,800	.....	8	.....
695	10,000	300	20,000	yes	.....	120	125	200	.....	2	1
696	15,000	300	14,000	yes	.....	80	180	300	1,700	3	.....
697	100,000	300	600,000	no	no	464	1,620	1,292	17,322	22	1
698	35,000	312	.....	no	no	250	100	.....	.....	8	1
699	35,000	250	77,000	no	no	138	325	150	.....	5	1
700	70,000	300	200,000	.....	yes	356	1,155	.....	5,000	17	.....
701	303,009	292	215,661	13	.....	778	524	3,195	.....	35	13
702	100,000	313	.....	.....	.....	1,130	432	.....	407,209	44	18
703	30,000	300	75,000	no	no	150	250	.....	2,200	6	.....
704	22,000	300	.....	.....	10	225	400	2,000	.....	3	1
705	450,000	280	800,000	no	no	1,500	7,000	.....	.....	40	.....
706	3,000	300	.....	no	no	40	45	175	.....	1	.....
707	13,476	300	.....	.....	.....	45	42	.....	.....	1	.....
708	25,000	312	75,000	10	.....	140	200	2,000	.....	3	1
709	12,000	300	.....	no	no	88	120	.....	.....	3	.....
710	5,000	312	.....	yes	.....	76	52	150	.....	1	.....
711	20,000	....	.....	.....	.....	237	373	.....	.....	5	.....
712	20,000	312	.....	yes	.....	156	185	500	.....	3	1
713	30,000	300	150,000	no	no	150	275	500	200	9	.....
714	30,000	300	40,000	3	.....	200	200	3,000	200	10	.....
715	22,500	310	40,000	.....	.....	230	550	1,000	350	5	1
716	20,000	304	62,000	.....	5	140	240	1,500	.....	9	.....
717	21,000	300	27,000	no	no	.....	.....	.....	.....	3	1
718	15,000	285	27,800	.....	yes	62	200	200	.....	2	.....
719	20,000	310	.....	no	no	260	175	.....	.....	3	.....
720	9,000	300	8,000	yes	.....	55	125	200	.....	2	.....
721	40,000	310	.....	.....	.....	.....	850	.....	.....	10	.....
722	27,121	263	64,816	.....	.....	147	818	.....	2,928	6	1
723	10,000	250	17,040	.....	.....	282	116	.....	.....	2	.....
724	20,000	300	.....	10	.....	15	.....	2,000	15	3	2
725	1,950,000	305	4,046,909	yes	.....	.....	8,542	20,712	.....	250	135
726	25,000	300	.....	.....	.....	50	150	.....	.....	3	.....
727	25,000	300	100,000	no	no	70	250	1,700	.....	5	1
728	5,000	200	.....	.....	.....	36	20	100	.....	2	.....

BAKERS, BREAD AND BISCUIT, AND

729	65,000	300	100,000	on	no	195	443	400	13,100	30	45
730	140,000	365	199,836	10	.....	476	542	2,876	.....	57	4
731	30,000	300	30,000	20	.....	12	750	16,500	.....	4	9
732	.....	300	900,000	yes	.....	4,000	1,100	.....	.....	150	250
733	434,817	310	827,847	.....	7	3,280	3,115	.....	.....	200	.....
734	250,000	300	829,434	15	.....	1,965	1,200	4,735	.....	70	120
735	50,000	300	100,000	.....	10	563	800	5,000	9,000	18	21

FROM MANUFACTURERS.

FOOD FACTORIES.—TABLE NO. 22.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c	$ c.	$ c.			$	%	%	%	%	
2,759	600	13 80	9 00	.....	.....	....	....	.....	7	....	7	.....	682
8,400	2,000	.....	.....	.....	.....	4	4	11,500	yes	....	.....	yes	683
450	.....	8 50	.....	.....	.....	....	....	.....	.....	....	.....	.....	684
2,288	.....	12 00	9 00	.....	.....	....	....	.....	1	....	1	.....	685
450	.....	15 00	9 00	.....	.....	1	....	500	no	no	.....	.....	686
13,520	both	13 50	10 00	7 50	4 50	2	3	5,300	10	....	10	10	687
1,248	.....	12 00	.....	.....	.....	....	....	.....	.....	....	.....	.....	688
300	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	689
400	.....	.....	7 50	.....	.....	....	....	.....	.....	....	.....	.....	690
2,000	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	691
6,564	.....	15 00	12 00	.....	.....	3	....	3,000	12½	....	12½	.....	692
3,000	.....	12 00	10 00	.....	.....	....	....	.....	.....	....	.....	.....	693
5,620	.....	9 40	.....	.....	.....	2	....	1,600	no	no	.....	.....	694
1,000	120	9 00	7 50	.....	.....	....	....	.....	no	no	.....	.....	695
1,600	.....	9 00	7 50	.....	.....	3	....	2,500	no	no	.....	.....	696
13,906	468	15 00	9 00	9 00	.....	3	1	4,128	5	....	5	5	697
3,700	520	.....	.....	.....	.....	....	....	.....	yes	....	yes	.....	698
3,500	200	.....	.....	.....	.....	....	....	.....	10	....	10	.....	699
8,500	.....	12 00	10 00	.....	.....	....	....	.....	.....	....	.....	.....	700
30,233	7,134	24 00	15 00	10 50	6 60	....	....	.....	.....	....	.....	.....	701
42,498	.....	21 50	15 00	11 00	8 40	4	1	6,360	yes	....	yes	yes	702
3,600	.....	12 00	.....	.....	.....	2	....	1,200	no	no	.....	.....	703
1,976	312	14 00	12 00	6 00	.....	....	....	.....	no	no	.....	.....	704
20,000	.....	18 00	13 00	.....	.....	6	2	10,000	no	no	.....	.....	705
180	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	706
600	.....	.....	.....	.....	.....	1	....	250	.....	....	.....	.....	707
2,100	400	18 00	12 00	.....	8 00	....	....	.....	no	no	.....	.....	708
2,000	.....	12 50	7 00	.....	.....	....	....	.....	no	no	.....	.....	709
525	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	710
3,200	.....	15 00	10 00	.....	.....	....	....	.....	.....	....	.....	.....	711
1,080	150	15 00	9 00	.....	.....	....	....	.....	.....	....	.....	.....	712
3,895	.....	.....	.....	.....	.....	1	1	1,480	.....	....	.....	.....	713
4,000	.....	12 00	10 00	.....	.....	....	....	.....	3	....	3	.....	714
3,600	600	12 00	9 00	12 00	.....	1	1	2,100	no	no	.....	.....	715
5,000	.....	6 50	5 00	.....	.....	....	....	.....	5	....	5	.....	716
1,900	100	.....	.....	.....	.....	1	....	800	no	no	.....	.....	717
864	.....	11 40	6 00	.....	.....	....	....	.....	yes	....	yes	.....	718
2,000	.....	12 00	9 00	.....	.....	....	....	.....	.....	....	.....	.....	719
650	.....	.....	9 00	.....	.....	....	....	.....	no	no	.....	.....	720
.....	.....	18 00	10 50	.....	.....	2	....	2,000	10	....	10	10	721
4,372	522	18 00	10 50	.....	.....	1	1	1,357	no	no	.....	.....	722
900	1,200	6 00	.....	.....	.....	....	....	.....	no	no	.....	.....	723
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	724
47,775	32,728	21 50	12 00	9 00	6 00	24	5	37,783	10	....	10	.....	725
2,000	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	726
1,600	250	.....	.....	.....	.....	....	....	2,000	no	no	.....	.....	727
140	.....	12 00	.....	.....	.....	....	....	.....	no	no	.....	.....	728

CONFECTIONERS.—TABLE NO. 23.

15,028	10,038	14 00	10 25	7 00	4 50	5	1	6,700	5	....	5	.....	729
41,603	1,768	16 00	13 00	14 00	7 00	....	....	.....	yes	....	yes	.....	730
3,500	3,200	22 00	12 00	10 00	6 00	1	....	2,000	2	....	2	.....	731
95,000	80,000	16 00	10 00	10 00	6 00	4	12	15,000	.....	....	.....	.....	732
151,667	.....	18 00	14 00	.....	.....	9	16	31,617	no	no	.....	.....	733
98,800	both	.....	.....	.....	.....	6	9	11,400	no	no	.....	.....	734
10,500	6,500	15 00	8 00	10 00	5 00	10	1	7,537	10	....	10	10	735

RETURNS IN DETAIL

CANNING, PORK PACKING, BACON

Office No.	Capital employed, including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
736	.....	175	51,489	30	.....	756	.....	.....	.....	50	75
737	345,767	300	225,000	.....	50	72	1,094	4,182	225,099	25	75
738	41,200	310	106,500	50	.....	99	105	.....	.....	15	.....
739	100,000	175	150,000	20	.....	140	1,400	3,800	83,000	50	75
740	.....	150	.....	.....	.....	378	.....	.....	31	5	20
741	120,000	300	400,000	15	.....	478	75,000	.....	.....	28	.....
742	.....	175	.....	.....	.....	293	.....	.....	.....	169	135
743	14,000	310	.....	no	no	.....	.....	.....	.....	12	.....
744	100,000	90	72,000	12	.....	17	107	55,000	3,000	46	70
745	7,000	21	3,000	.....	80	31	120	.....	.....	6	16
746	30,000	280	40,000	.....	.....	117	11,000	.....	.....	11	.....
747	50,000	75	60,000	25	.....	215	.....	5,000	10,000	45	75
748	10,000	45	2,000	.....	yes	55	60	.....	.....	8	8
749	5,500	26	2,000	.....	75	37	58	2,500	50	7	8
750	100,000	300	1,208,069	16½	.....	1,254	536	8,778	11,200	50	.....
751	25,000	300	50,000	10	.....	95	400	2,000	.....	10	7
752	70,000	150	65,000	.....	5	130	991	2,000	.....	25	30
753	60,000	140	54,000	.....	yes	234	.....	.....	.....	40	30
754	15,000	310	75,000	no	no	16	7,000	.....	.....	25	.....
755	150,000	150	50,000	.....	yes	304	1,500	1,000	800	35	80
756	1,550,000	200	10,000,000	25	.....	3,800	5,000	700,000	.....	300	15
757	150,000	310	90,000	15	.....	475	1,600	6,500	9,500	30	40
758	15,000	200	6,000	.....	.....	60	75	.....	300	7	4
759	15,000	310	70,000	.....	yes	.....	125	.....	.....	10	30
760	13,200	310	150,000	yes	.....	40	45	1,100	200	5	1
761	400,000	120	295,000	no	no	228	2,546	24,500	226,230	70	120
762	60,000	150	100,000	5	.....	125	.....	200	.....	20	80
763	150,000	365	1,163,000	.....	5	1,957	2,300	.....	.....	80	.....
764	4,000	24	1,600	.....	yes	74	39	.....	.....	6	12
765	208,000	306	322,862	.....	41	485	1,205	30,764	23,026	70	70
766	50,000	312	89,938	no	no	145	198	357	.....	8	.....
767	49,000	310	50,000	10	.....	456	590	200	2,100	8	.....
768	870,000	310	1,980,000	10	.....	3,275	.....	125,000	253,000	147	.....
769	75,000	100	42,500	8	.....	208	512	2,190	.....	45	10
770	40,000	150	30,000	no	no	50	200	4,900	.....	35	40
771	25,000	90	45,000	20	.....	600	1,200	6,000	.....	30	45
772	136,569	107	134,814	14	.....	219	825	10,635	102,347	63	125
773	106,732	103	43,294	9	.....	118	624	3,315	28,954	25	40
774	88,328	120	86,000	22	.....	60	567	3,568	74,486	30	50
775	128,298	200	117,709	no	no	135	726	1,265	93,959	20	85
776	194,083	180	162,244	20	.....	135	725	30,568	115,412	50	150
777	893,646	300	1,371,203	10	.....	1,350	900	147,264	1,081,954	255	174
778	70,607	120	82,744	6	.....	401	525	1,133	6,840	170	70
779	151,480	160	109,158	.....	10	687	655	5,493	89,189	60	50
780	500,000	310	2,872,132	no	no	1,350	8,500	.....	.....	126	2
781	7,000	10	3,000	.....	75	34	210	.....	.....	2	8
782	.....	182	.....	10	.....	.....	.....	.....	.....	30	80
783	4,000	60	15,000	.....	yes	75	25	500	150	30	35

FROM MANUFACTURERS.

CURING, ABATTOIRS, ETC.—TABLE No. 24.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
19,000	2,000	13 50	10 50	6 00	6 00	4	....	4,520	10	....	10	10	736
13,961	5,000	15 00	6 00	6 00	6 00	6	4	6,671	5	....	.....	5	737
6,700	.....	.....	.....	.....	.....	5	....	3,000	10	....	10	.....	738
7,000	5,000	12 00	9 00	7 50	6 00	4	....	7,000	no	no	.....	.....	739
3,362	702	.....	.....	.....	.....	1	1	1,352	.....	....	.....	.....	740
16,850	.....	18 00	12 00	.....	.....	3	....	5,400	no	no	.....	.....	741
40,382	both	12 00	10 00	6 00	6 00	1	2	2,910	no	no	.....	.....	742
7,000	.....	11 00	.....	.....	.....	....	....	.....	.....	....	.....	.....	743
6,049	3,972	15 00	12 00	15 00	.....	1	....	1,800	12½	....	12½	.....	744
660	both	12 00	.....	7 50	.....	....	....	.....	no	no	.....	.....	745
7,450	.....	13 00	.....	.....	.....	3	....	5,160	.....	....	.....	.....	746
5,500	2,200	12 00	9 00	10 00	9 00	1	1	1,800	.....	....	.....	.....	747
350	150	12 00	.....	.....	.....	....	....	.....	.....	....	.....	.....	748
375	135	12 00	9 00	4 50	.....	1	....	1,150	no	no	.....	.....	749
29,346	.....	15 00	12 00	.....	.....	10	1	10,891	no	no	.....	.....	750
3,500	2,000	12 00	9 00	9 00	6 00	....	....	.....	.....	....	.....	.....	751
10,000	both	15 00	10 50	7 50	6 00	2	1	3,500	no	no	.....	.....	752
5,100	1,800	13 50	9 00	6 00	.....	1	1	2,600	.....	....	.....	.....	753
12,000	.....	22 00	18 00	.....	.....	3	....	5,600	5	....	5	.....	754
13,500	both	12 00	10 00	.....	.....	5	1	8,000	no	no	.....	.....	755
185,000	6,500	.....	.....	.....	.....	45	16	60,000	.....	....	.....	.....	756
9,000	3,000	21 50	12 00	6 00	4 50	2	....	4,500	10	....	10	.....	757
1,200	750	12 00	.....	7 50	.....	....	....	.....	.....	....	.....	.....	758
8,185	.....	12 00	10 00	.....	.....	....	....	.....	.....	....	.....	.....	759
8,200	both	.....	.....	.....	.....	2	1	2,500	yes	....	yes	.....	760
42,260	both	20 00	10 50	.....	.....	5	1	10,184	no	no	.....	.....	761
6,000	8,000	.....	12 00	.....	6 00	2	1	3,300	2	....	2	.....	762
36,000	.....	15 00	10 50	.....	.....	8	....	18,000	15	....	15	15	763
3,000	300	.....	12 00	.....	6 00	....	....	.....	10	....	10	.....	764
32,899	21,003	15 00	9 00	.....	9 00	5	....	15,819	27	....	27	27	765
3,640	.....	15 00	10 50	.....	.....	5	....	4,856	no	no	.....	.....	766
6,413	.....	18 00	15 00	.....	.....	6	3	9,409	10	....	10	.....	767
114,560	.....	18 00	12 00	.....	.....	10	4	22,880	5	....	5	.....	768
5,000	both	12 00	10 50	.....	.....	3	1	2,330	25	....	25	.....	769
3,500	1,500	10 50	8 00	6 00	4 50	2	....	1,100	10	....	10	.....	770
5,200	2,000	15 00	12 00	9 00	7 50	2	....	1,450	no	no	.....	.....	771
19,328	8,244	15 00	12 00	7 50	6 00	3	....	.....	no	no	.....	.....	772
6,895	1,002	15 00	10 50	7 50	6 00	2	....	2,780	no	no	.....	.....	773
9,105	both	15 00	12 00	.....	6 00	3	....	2,300	10	....	10	10	774
8,500	7,200	13 20	10 50	7 50	6 00	2	1	1,200	no	no	.....	.....	775
16,092	13,864	15 00	10 50	7 50	6 00	....	2	2,000	5	....	5	5	776
88,714	40,539	18 00	12 00	12 00	6 00	10	5	18,800	no	no	.....	.....	777
2,721	4,164	10 50	9 00	6 00	4 80	1	1	2,160	23	....	13	10	778
11,980	5,009	15 00	12 00	7 50	6 00	3	....	2,000	25	....	25	.....	779
54,921	1,026	15 00	10 50	.....	.....	12	2	32,000	5	....	5	.....	780
100	250	12 00	.....	9 00	7 50	....	....	.....	no	no	.....	.....	781
.....	.....	18 00	12 00	10 00	.....	....	1	468	no	no	.....	.....	782
3,000	2,000	18 00	12 00	7 50	3 00	....	....	.....	no	no	.....	.....	783

RETURNS IN DETAIL

DAIRY PRODUCTS AND OTHER

Office No.	Capital employed including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
784	15,000	310	50,000	no	no	100	95	3,000	.....	2	2
785	6,000	310	44,704	.....	15	47	68	150	5,500	4	.....
786	40,000	310	161,000	15	.....	870	850	.....	4,650	10	12
787	5,000	310	22,000	40	.....	130	75	.....	.....	1	.....
788	28,500	310	24,465	no	no	174	260	850	.....	.....	.....
789	40,000	150	16,830	no	no	90	143	.....	.....	9	.....
790	50,000	310	150,000	yes	.....	500	500	.....	.....	21	11
791	9,000	300	36,234	6	.....	67	175	.....	.....	3	5
792	20,000	310	58,073	yes	.....	74	108	.....	2,839	4	.....
793	100,000	305	250,000	no	no	1,000	800	7,000	.....	30	20
794	8,000	313	20,000	no	no	108	96	.....	.....	6	1
795	469,131	300	979,490	9½	.....	2,759	1,684	34,976	8,467	85	125
796	190,000	300	195,000	.....	8½	956	2,019	3,838	.....	14	10
797	10,000	80	3,000	no	no	5,805	5,294	300	.....	3	.....
798	3,000	200	14,769	.....	8	10	17	400	.....	3	.....
799	100,000	150	6,160	.....	10	330	1,025	70,000	9,000	10	.....
800	642,251	310	1,332,601	22	.....	1,465	1,056	17,970	1,216,546	125	66
801	16,000	280	50,000	10	.....	186	228	385	2,200	8	2
802	776,000	365	.....	.....	.....	3,696	5,245	.....	.....	164	14
803	25,511	310	53,559	1	.....	91	154	.....	35,206	5	3

BREWERIES, DISTILLERIES AND WINE FACTORIES

804	35,000	313	110,000	.....	12½	129	410	.....	.....	700	1,400
805	58,500	311	58,203	11	.....	228	536	1,500	9,754	18	.....
806	166,200	309	150,000	9	.....	184	1,462	404	3,654	13	.....
807	65,000	310	39,805	18	.....	376	269	750	4,618	9	2
808	40,000	312	75,000	no	no	500	.....	500	.....	15	.....
809	30,000	130	6,000	20	.....	315	76	.....	.....	6	3
810	100,000	150	20,000	15	.....	90	225	.....	.....	6	1
811	370,000	310	275,000	10	.....	3,400	6,500	.....	.....	65	1
812	5,000	300	4,500	.....	10	18	35	.....	.....	4	.....
813	32,095	313	25,597	no	no	367	267	.....	.....	5	.....
814	.....	300	13,000	10	.....	150	155	1,000	9,500	2	.....
815	3,000	300	1,000	no	no	50	32	.....	.....	1	.....
816	131,000	300	181,000	.....	12	525	310	3,500	.....	20	15
817	30,000	300	30,000	yes	.....	600	300	.....	2,000	8	.....
818	50,000	310	10,000	.....	yes	217	165	.....	.....	4	.....
819	100,000	313	26,880	no	no	511	529	162	.....	9	.....
820	15,000	310	60,000	10	.....	60	100	1,000	.....	30	2
821	1,600,000	312	663,000	19	.....	24,197	26,339	.....	.....	227	.....
822	75,000	300	216,000	.....	25	391	1,312	.....	25,000	80	30
823	820,843	295	1,416,684	½	.....	1,675	6,338	5,471	1,138,880	107	114
824	500,000	300	651,099	.....	30	1,666	4,733	2,249	245,175	280	100
825	240,178	306	373,314	.....	yes	926	3,056	3,500	7,041	75	15
826	75,000	310	60,000	.....	.....	500	575	.....	20,000	12	.....
827	180,000	300	315,000	20	.....	482	1,140	500	.....	70	35
828	89,500	312	100,000	50	.....	375	325	5,000	2,200	20	.....
829	91,500	313	163,289	yes	.....	1,375	1,074	10,451	.....	33	.....
830	600,000	310	171,480	no	no	5,000	2,200	26,000	100,000	50	.....
831	126,050	300	70,000	.....	14	143	794	3,000	1,583	5	.....
832	155,000	280	85,322	20	.....	311	1,049	170	.....	120	35

FROM MANUFACTURERS.

FOODS.—TABLE No. 25.

Total wages paid during year to wage-earners.		Weekly wages paid. Male.		Female.		Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
1,150	416	.....	.....	.....	.....	1	....	780	no	no	.....	.....	784
600	.....	6 00	3 00	.....	.....	1	....	200	no	no	.....	.....	785
6,600	3,200	15 00	9 00	5 50	3 50	3	3	4,600	no	no	.....	.....	786
780	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	787
7,372	.....	.....	10 50	.....	.....	1	....	1,100	25	....	25	.....	788
4,300	.....	.....	12 00	.....	.....	1	....	900	20	....	20	.....	789
6,573	2,860	20 00	12 00	.....	9 00	3	3	5,000	no	no	.....	.....	790
1,560	1,350	13 00	3 50	6 00	.....	3	....	2,384	.....	....	.....	.....	791
1,123	.....	.....	.....	.....	.....	....	2	1,000	yes	....	yes	yes	792
24,000	9,000	16 00	12 00	12 00	8 00	10	2	13,000	8	....	8	.....	793
2,408	50	15 00	12 00	.....	6 00	....	....	.....	.....	....	.....	.....	794
64,351	both	15 00	5 50	7 50	3 50	26	4	45,023	yes	....	yes	yes	795
10,529	both	25 00	14 00	9 00	7 00	6	4	7,880	.....	....	.....	.....	796
1,000	.....	9 00	.....	.....	.....	2	....	515	no	no	.....	.....	797
1,000	.....	.....	.....	.....	.....	1	....	100	10	....	10	.....	798
1,158	.....	18 00	12 00	.....	.....	2	1	2,700	10	....	10	10	799
81,937	26,671	24 00	10 50	8 10	6 60	5	2	7,447	no	no	.....	.....	800
4,628	624	15 00	11 00	7 00	5 00	1	....	2,500	2	....	2	.....	801
.....	.....	.....	.....	.....	.....	18	2	.....	no	no	.....	.....	802
2,300	1,667	.....	12 00	.....	7 00	1	4	4,967	no	no	.....	.....	803

CIGAR AND TOBACCO FACTORIES.—TABLE No. 26.

65,000	13,000	.....	.....	.....	.....	2	1	3,800	15	....	15	.....	804
11,408	.....	30 00	11 00	.....	.....	2	....	1,474	no	no	.....	.....	805
7,605	.....	14 00	10 00	.....	.....	3	2	7,400	no	no	.....	.....	806
4,197	600	.....	12 00	.....	6 00	2	2	2,335	no	no	.....	.....	807
9,000	.....	15 00	12 00	.....	.....	....	....	.....	no	no	.....	.....	808
1,000	60	9 00	7 00	.....	4 00	....	....	.....	.....	....	.....	.....	809
900	90	9 00	.....	.....	3 60	1	....	.....	.....	....	.....	.....	810
15,000	both	.....	.....	.....	.....	3	....	5,500	10	....	10	10	811
1,800	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	812
3,447	.....	.....	.....	.....	.....	....	1	546	.....	....	.....	.....	813
1,248	.....	14 00	10 50	.....	.....	1	1	1,800	10	....	10	.....	814
500	.....	.....	9 00	.....	.....	....	....	.....	no	no	.....	.....	815
11,750	2,250	.....	10 50	.....	4 50	3	1	4,800	no	no	.....	.....	816
5,000	.....	15 00	12 00	.....	.....	....	....	.....	5	....	5	.....	817
1,980	.....	9 00	7 00	.....	.....	2	....	1,560	no	no	.....	.....	818
4,921	.....	.....	10 50	.....	.....	3	1	3,850	no	no	.....	.....	819
20,000	both	.....	.....	7 00	.....	2	1	2,500	10	....	10	.....	820
131,386	.....	.....	.....	.....	.....	18	....	31,270	.....	....	.....	.....	821
56,700	both	.....	.....	.....	.....	12	2	23,000	.....	25	25	.....	822
93,788	both	.....	.....	.....	.....	11	2	23,748	no	no	.....	.....	823
169,449	25,477	12 00	8 00	12 00	6 00	13	....	42,571	.....	20	.....	.....	824
87,250	both	16 00	.....	7 50	.....	8	1	19,000	.....	....	.....	.....	825
8,000	.....	18 00	12 00	.....	.....	....	1	350	.....	....	.....	.....	826
61,880	25,480	piecew'k	.....	.....	.....	2	1	2,400	.....	....	.....	.....	827
15,185	.....	18 00	13 50	.....	.....	6	....	9,800	10	....	.....	10	828
21,463	.....	.....	.....	.....	.....	5	....	9,800	.....	....	.....	.....	829
35,700	.....	27 00	12 25	.....	.....	14	1	10,600	no	no	.....	.....	830
4,021	.....	18 00	12 00	.....	.....	2	....	2,100	12	....	12	12	831
62,850	9,247	piecew'k	.....	piece	work	5	2	7,488	no	no	.....	.....	832

RETURNS IN DETAIL

Chemical Works, Medicines

Office No.	Capital employed, including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year. Increased.	Production during year. Decreased.	Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees wage-earners only. Male.	Total No. of employees wage-earners only. Female.
	$		$	%	%	$	$	$	$		
833	60,000	300	150,000	no	no	600	500	.....	.....	10	25
834	150,000	280	275,000	.....	.....	1,200	1,800	.....	.....	40	20
835	250,000	365	80,000	.....	.....	611	4,040	40,000	.....	60	.....
836	40,000	175	62,193	.....	8	109	104	.....	.....	20	.....
837	28,000	310	35,000	.....	6	305	530	.....	31,938	2	7
838	560,000	300	568,132	11	.....	2,419	722	6,000	110,750	75	125
839	100,000	300	100,000	5	.....	122	797	9,572	15,000	6	15
840	25,000	310	15,000	75	.....	80	.....	18,000	.....	2	6
841	20,000	310	61,000	.....	1½	630	380	.....	400	8	.....
842	5,000	310	14,319	5	.....	190	.....	.....	.....	2	2
843	282,400	300	56,118	.....	.....	472	1,594	21,144	33,825	35	.....
844	6,000	105	10,000	10	.....	158	54	.....	.....	1	.....
845	150,000	310	50,000	10	.....	388	149	.....	.....	4	2
846	1,800,000	365	900,000	50	.....	2,391	2,515	1,000,000	484,308	500	.....
847	3,000	160	3,255	.....	10	29	.....	.....	.....	1	.....
848	40,000	300	38,000	yes	.....	290	313	7,000	11,000	6	.....
849	500,000	300	413,019	8	.....	1,081	1,355	19,759	121,118	47	75
850	19,648	300	10,186	.....	16	10	330	.....	2,883	2	56
851	75,000	283	26,230	.....	25	261	30,000	.....	.....	4	4

Oil Refineries, Paint and Varnish

852	3,000	175	4,000	no	no	36	.....	.....	.....	1	.....
853	16,000	306	18,000	.....	.....	130	50	.....	.....	5	1
854	25,000	300	50,000	15	.....	200	250	1,000	5,000	3	2
855	10,000	300	24,000	10	.....	113	30	.....	.....	3	.....
856	200,000	300	235,000	2	.....	1,000	1,000	23,000	.....	135	.....
857	150,000	300	150,123	no	no	977	480	.....	.....	16	2
858	100,000	313	69,058	.....	4 1/10	466	795	14,680	50,076	7	2
859	111,000	308	120,000	10	.....	686	1,400	1,200	5,500	20	.....
860	.....	307	.....	.....	.....	.....	.....	537,530	.....	.....	7
861	54,520	307	32,364	10	.....	99	172	.....	.....	3	.....
862	30,000	313	52,000	.....	yes	75	256	.....	.....	5	2
863	143,232	310	254,000	15	.....	1,095	800	5,000	34,913	35	2
864	.....	310	50,000	yes	.....	120	72	3,500	.....	3	1
865	30,000	290	15,000	.....	.....	500	210	191	1,500	4	.....
866	300,000	310	280,000	14	.....	1,150	3,981	.....	80,000	35	25
867	100,000	300	300,000	.....	10	425	1,200	3,000	.....	12	.....

Gas Works, Electric Light, Heating

868	120,000	365	78,000	.....	.....	.....	900	.....	31,765	18	.....
869	278,000	365	36,475	.....	88	2,397	560	.....	3,152	6	.....
870	.....	365	147,210	yes	.....	71	301	76,542	109,463	25	.....
871	17,000	300	30,000	8	.....	47	51	43	2,604	1	.....
872	25,000	365	6,450	.....	10	78	.....	1,500	627	1	.....
873	30,000	308	.....	15	.....	182	93	88,389	.....	20	.....
874	5,000	90	4,900	.....	10	83	103	200	.....	9	.....
875	20,000	351	4,500	.....	16⅔	127	364	1,400	1,038	2	.....
876	60,000	365	8,000	3	.....	200	75	200	.....	4	.....
877	15,000	365	5,168	yes	.....	.....	35	.....	2,126	1	.....
878	6,500	300	10,000	30	.....	28	50	78	.....	5	.....

FROM MANUFACTURERS.

AND PERFUMES.—TABLE No. 27.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
6,240	7,800	12 00	.....	6 00	.....	5	2	9,000	no	no	.....	.....	833
24,650	6,500	12 00	11 10	6 00	.....	2	2	.....	.....	....	.....	.....	834
32,153	.....	18 00	12 00	.....	.....	4	....	4,915	.....	....	.....	.....	835
4,594	.....	.....	.....	.....	.....	3	2	4,926	no	no	.....	.....	836
624	1,613	.....	12 00	6 00	.....	1	....	1,040	no	no	.....	.....	837
78,515	both	15 00	.....	9 60	6 00	18	18	44,601	10	....	10	10	838
3,650	4,761	15 00	10 00	9 00	6 00	11	3	10,989	10	....	10	....	839
3,100	2,000	.....	.....	8 00	6 00	1	....	3,400	15	....	15	15	840
5,430	.....	20 00	8 00	.....	.....	1	....	1,500	4	....	4	.....	841
1,040	900	.....	10 00	.....	5 00	1	1	3,010	no	no	.....	.....	842
21,370	.....	15 00	12 00	.....	.....	8	....	11,550	no	no	.....	.....	843
3,120	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	844
1,872	624	.....	9 00	.....	6 00	1	....	1,140	no	no	.....	.....	845
188,819	.....	24 00	12 00	.....	.....	37	3	31,988	7½	....	7½	7½	846
325	.....	.....	.....	.....	.....	....	....	.....	no	no	.....	.....	847
4,700	.....	.....	.....	.....	.....	2	1	2,800	no	no	.....	.....	848
29,389	19,593	23 00	10 00	8 00	4 50	4	1	4,100	10	....	10	10	849
960	5,460	15 00	9 00	6 00	5 10	1	....	1,943	no	no	.....	.....	850
3,165	both	15 00	9 00	p. wk	6 00	3	2	3,912	no	no	.....	.....	851
				p. wk									

FACTORIES.—TABLE No. 28.

160	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	852
2,600	400	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	853
1,560	780	.....	.....	.....	.....	4	....	8,000	5	....	5	5	854
1,750	.....	15 00	11 00	.....	.....	1	....	1,000	no	no	.....	.....	855
62,000	.....	13 50	11 00	.....	.....	3	6	8,000	10	....	10	10	856
11,645	562	15 00	11 00	8 00	6 00	6	3	11,304	no	no	.....	.....	857
5,137	686	.....	14 00	.....	6 60	2	....	3,000	7 6/10	....	7 6/10	7 6/10	858
11,000	.....	.....	.....	.....	.....	8	1	6,360	25	....	25	25	859
.....	720	.....	.....	18 00	12 00	115	26	.....	.....	....	.....	.....	860
1,692	.....	16 50	8 00	.....	.....	....	....	.....	.....	....	.....	.....	861
2,925	both	.....	.....	.....	.....	5	1	7,030	yes	....	.....	.....	862
18,744	both	24 00	12 00	.....	.....	3	2	14,775	10	....	10	10	863
2,100	both	.....	.....	.....	.....	3	1	4,850	.....	....	.....	.....	864
2,200	.....	.....	12 00	.....	.....	....	....	.....	10	....	10	.....	865
30,704	both	.....	.....	.....	.....	20	17	37,000	no	no	.....	.....	866
9,000	.....	.....	.....	.....	.....	7	4	11,600	no	no	.....	.....	867

AND POWER WORKS.—TABLE No. 29.

7,918	.....	21 50	13 50	.....	.....	3	1	3,538	no	no	.....	.....	868
4,107	.....	12 00	9 00	.....	.....	1	2	2,910	.....	....	.....	.....	869
17,795	.....	19 20	.....	.....	.....	5	1	5,241	48	....	48	19	870
756	.....	15 00	.....	.....	.....	1	1	926	10	....	10	10	871
300	.....	.....	.....	.....	.....	2	....	800	no	no	.....	.....	872
11,117	.....	18 00	12 00	.....	.....	1	....	240	no	no	.....	.....	873
1,283	.....	15 00	9 00	.....	.....	....	....	.....	.....	....	.....	.....	874
1,200	.....	15 00	12 00	.....	.....	2	....	300	no	no	.....	.....	875
2,400	.....	13 00	11 00	.....	.....	....	....	.....	no	no	.....	.....	876
1,029	.....	.....	.....	.....	.....	1	....	150	.....	....	.....	.....	877
4,000	.....	20 00	12 00	.....	.....	....	....	.....	.....	....	.....	.....	878

RETURNS IN DETAIL

GAS WORKS, ELECTRIC LIGHT,

Office No.	Capital employed including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year. Increased.	Production during year. Decreased.	Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only. Male.	Total No. of employees, wage-earners only. Female.
	$		$	%	%	$	$	$	$		
879	406,000	365	200,000	10	.....	3,141	471	43,000	.....	8	.....
880	8,854,518	365	2,294,308	11	.....	93,398	21,392	48,254	1,282,888	1,396	.....
881	35,000	365	7,500	no	no	105	129	.....	.....	3	.....
882	115,848	365	17,727	.....	6	2,002	1,000	1,592	796	5	.....
883	.....	365	.....	.....	.....	.....	.....	.....	.....	5	.....
884	129,300	365	7,998	25	.....	238	300	500	4,387	8	.....
885	79,000	365	13,000	10	.....	.....	300	12,000	4,600	3	.....
886	6,000	301	19,700	.....	24	100	148	.....	.....	2	15
887	250,000	365	26,500	20	.....	441	295	6,500	245	5	1
888	164,000	365	18,500	.....	2½	1,512	151	1,000	3,933	9	1
889	5,000	310	3,600	yes	.....	.....	.....	.....	.....	4	.....
890	.....	365	12,326	5	.....	.....	74	3,500	.....	5	.....
891	20.000	365	12,296	20	.....	359	128	.....	1,016	.....	.....
892	541,121	365	191,452	20	.....	.....	.....	.....	.....	42	.....

PRINTING AND

893	5,767	312	6,314	.....	9	23	200	178	3,135	6	2
894	179,800	300	311,226	14	.....	1,775	900	11,558	15,939	82	30
895	100,000	310	200,000	no	no	150	1,000	.....	.....	135	2
896	4,200	308	4,020	1	.....	16	25	.....	.....	2	.....
897	5,000	310	2,800	.....	5	.....	52	60	.....	6	1
898	55,000	340	110,000	yes	.....	292	1,343	.....	.....	46	6
899	21,400	310	18,500	2	.....	57	79	350	7,343	18	1
900	6,500	....	.....	.....	.....	.....	.....	.....	.....	.....	.....
901	100,000	310	125,000	10	.....	314	924	.....	.....	36	5
902	75,000	310	79,569	8	.....	575	768	70	.....	37	8
903	3,000	300	12,000	20	.....	.....	50	700	.....	8	1
904	50,000	300	60,000	no	no	288	340	600	.....	37	3
905	6,500	310	10,016	.....	yes	30	43	75	120	1	2
906	10,000	310	6,200	25	.....	10	66	.....	.....	7	.....
907	35,000	310	26,000	10	.....	1,300	340	.....	.....	13	6
908	100,000	310	92,501	13	.....	433	761	2,293	5,040	30	50
909	55,000	304	41,112	15	.....	456	259	4,313	4,947	21	4
910	200,000	306	325,000	yes	.....	3,000	1,500	.....	22,000	125	45
911	200,000	300	200,000	15	.....	.....	650	7,000	.....	80	20
912	40,000	310	59,000	8	.....	360	300	.....	2,000	30	9
913	29,288	300	26,000	13	.....	142	108	700	600	9	3
914	6,000	275	12,000	no	no	40	45	.....	.....	4	3
915	7,000	300	5,088	8½	.....	26	13	2,700	2,000	3	3

BRICK, TILE AND PORTLAND

916	140,000	100	53,000	no	no	589	630	15,000	.....	70	.....
917	200,000	60	30,000	.....	.....	18	2,000	.....	.....	60	.....
918	20,000	200	23,364	no	no	52	300	900	10,658	36	.....
919	30,000	125	14,250	no	no	219	.....	1,000	.....	25	.....
920	252,900	300	91,602	.....	55	55	346	20,000	22,121	61	.....
921	60,000	156	37,000	30	.....	147	340	1,500	.....	24	.....

FROM MANUFACTURERS.

Heating and Power Works.—Table No. 29.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
8,000	.....	15 00	12 00	.....	.....	22	2	12,600	5	....	.....	5	879
881,061	.....	20 40	14 40	.....	.....	35	39	82,590	no	no	.....	.....	880
2,500	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	881
3,946	.....	25 00	14 00	.....	.....	1	....	300	10	....	10	.....	882
.....	.....	21 50	.....	.....	.....	2	1	2,160	.....	....	.....	.....	883
2,831	.....	15 00	12 00	.....	.....	2	1	953	no	no	.....	.....	884
2,200	.....	18 00	12 00	.....	.....	....	....	.....	10	....	10	.....	885
1,195	2,150	18 00	12 00	12 00	7 50	1	1	2,500	no	no	.....	.....	886
3,540	416	15 00	9 00	6 00	.....	....	....	.....	no	no	.....	.....	887
5,960	300	.....	.....	.....	.....	....	....	.....	10	....	10	.....	888
1,800	.....	.....	.....	.....	.....	1	1	both	yes	....	yes	.....	889
2,571	.....	18 00	12 00	.....	.....	....	....	.....	no	no	.....	.....	890
.....	1,250	.....	.....	.....	.....	2	....	1,484	no	no	.....	.....	891
34,000	.....	.....	.....	.....	.....	6	2	10,000	15	....	15	.....	892

Allied Trades.—Table No. 30.

2,149	1,546	15 00	10 00	9 00	3 50	1	....	1,560	no	no	.....	.....	893
53,123	12,480	20 00	15 00	10 00	7 00	12	8	17,130	10	....	10	10	894
95,000	2,000	.....	.....	.....	.....	9	8	20,000	no	no	.....	.....	895
350	.....	12 00	4 20	.....	.....	2	....	2,250	10	....	10	.....	896
1,300	.....	10 00	4 00	6 00	.....	....	1	312	no	no	.....	.....	897
26,496	3,530	25 00	12 00	9 00	.....	7	1	9,500	5	....	5	.....	898
6,099	520	.....	.....	.....	.....	2	....	4,200	2	....	2	.....	899
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	900
25,000	1,400	18 50	8 00	8 00	5 00	6	3	8,800	3	....	3	.....	901
20,416	2,340	16 63	3 53	3 50	.....	14	9	13,645	.....	2	2	.....	902
9,600	520	22 00	.....	.....	.....	1	....	1,300	20	....	20	.....	903
23,080	1,200	16 00	.....	8 00	.....	....	3	1,600	10	....	10	.....	904
724	364	12 00	.....	5 00	.....	....	....	.....	.....	....	.....	.....	905
4,056	.....	15 00	.....	.....	.....	2	....	1,520	10	....	10	.....	906
9,000	1,900	17 00	8 00	8 00	5 00	....	....	.....	.....	....	.....	.....	907
15,150	29,550	15 00	10 00	13 50	7 00	100	85	11,475	5	....	5	5	908
18,962	1,534	19 71	16 50	7 12	6 00	3	1	4,680	10	....	10	.....	909
68,000	12,000	18 50	12 00	15 00	7 00	13	8	30,000	20	....	20	20	910
40,000	5,000	.....	.....	.....	.....	10	6	10,000	10	....	10	.....	911
20,000	2,000	18 00	6 00	7 00	.....	....	....	.....	9	....	9	.....	912
5,587	780	18 00	6 00	6 00	.....	2	....	2,226	25	....	25	25	913
2,500	950	.....	.....	6 00	.....	....	1	1,200	no	no	.....	.....	914
1,050	both	.....	.....	.....	.....	....	....	.....	20	....	20	.....	915

Cement Works.—Table No. 31.

27,000	.....	21 50	15 00	.....	.....	1	....	375	no	no	.....	.....	916
11,128	.....	18 00	15 00	.....	.....	4	....	6,400	.....	....	.....	.....	917
11,454	.....	15 00	12 00	.....	.....	....	....	.....	20	....	20	.....	918
7,858	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	919
47,501	.....	12 00	10 50	.....	.....	7	1	14,149	4	....	4	.....	920
11,200	.....	21 50	15 00	.....	.....	....	....	.....	.....	....	.....	.....	921

RETURNS IN DETAIL

BRICK, TILE AND PORTLAND

Office No.	Capital employed including plant.	No. of days in operation during 1913.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
922	309,020	230	89,837	.....	20	445	1,336	.....	84,352	40	1
923	10,000	310	15,000	10	.....	50	150	.....	.....	9	.....
924	64,096	200	23,100	30	.....	264	.....	.....	.....	50	.....
925	2,000	100	2,600	8	.....	33	.....	.....	700	5	.....
926	20,000	200	19,000	10	.....	35	.....	.....	.....	21	.....
927	160,100	306	113,000	.....	51½	1,046	1,991	4,097	51,956	55	.....
928	70,000	280	56,921	35	.....	123	140	13,000	12,394	22	.....
929	15,500	300	13,000	.....	.....	.....	22	.....	.....	.....	.....
930	50,000	300	50,000	no	no	275	450	.....	.....	30	.....
931	1,000,000	220	300,000	10	.....	700	750	8,000	.....	125	.....
932	.....	310	.....	20	.....	275	180	.....	.....	5	25
933	80,000	225	67,881	10	.....	175	75	3,084	302	40	.....
934	5,000	310	6,000	25	.....	45	20	.....	.....	3	.....
935	6,901,395	365	5,844,845	12	.....	40,177	26,473	801,483	.....	2,476	.....
936	15,000	300	20,000	no	no	105	380	.....	5,760	9	.....
937	300,000	275	190,000	10	.....	.....	1,550	.....	.....	75	.....
938	10,615	301	16,279	10	.....	30	46	1,848	4,912	10	.....
939	50,000	170	48,150	12	.....	240	180	3,600	6,000	55	.....
940	46,630	313	71,021	15	.....	117	729	1,574	58,039	20	.....
941	300,000	300	91,000	yes	.....	362	618	5,650	.....	84	.....
942	10,000	300	6,200	.....	.....	108	75	.....	.....	8	.....

MISCELLANEOUS

943	30,000	325	94,028	.....	25	254	233	.....	.....	38	.....
944	35,000	300	29,000	10	.....	129	350	2,500	.....	4	15
945	60,000	300	100,000	no	no	101	552	.....	4,000	9	30
946	100,000	313	170,000	10	.....	360	800	1,000	.....	30	30
947	52,774	300	35,639	no	no	253	918	.....	.....	116	.....
948	20,000	312	25,000	.....	25	550	300	3,000	.....	8	.....
949	76,058	300	41,109	.....	yes	365	429	352	9,452	7	13
950	87,018	365	106,650	.....	10	246	.....	.....	82,817	30	.....
951	10,000	200	.....	.....	33	16	50	1,000	.....	4	.....

FROM MANUFACTURERS.

CEMENT WORKS.—TABLE NO. 31.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
31,200	both	15 00	10 50	7 50	.....	4	....	4,970	5	....	5	5	922
5,000	.....	15 00	7 50	.....	.....	....	....	.....	2	....	2	.....	923
10,806	.....	18 00	15 00	.....	.....	2	....	800	no	no	.....	.....	924
800	.....	12 00	6 00	.....	.....	....	....	.....	5	....	5	.....	925
6,149	.....	16 50	12 00	.....	.....	....	....	.....	.....	....	.....	.....	926
41,594	.....	18 00	15 00	.....	.....	16	1	21,154	no	no	.....	.....	927
12,135	.....	19 50	15 00	.....	.....	2	....	1,890	no	no	.....	.....	928
.....	.....	.....	.....	.....	.....	2	....	960	.....	....	.....	.....	929
20,000	.....	.....	.....	.....	.....	3	....	5,000	no	no	.....	.....	930
42,000	.....	18 00	12 00	.....	.....	6	1	6,000	5	....	5	5	931
5,000	both	15 00	.....	6 00	.....	....	....	.....	.....	....	.....	.....	932
22,672	.....	12 00	.....	.....	.....	2	....	2,647	5	....	5	.....	933
1,800	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	934
2,259,926	.....	18 00	13 20	.....	.....	201	12	343,415	yes	....	yes	.....	935
5,400	.....	.....	13 80	.....	.....	2	1	2,600	.....	....	.....	.....	936
45,000	.....	18 00	13 80	.....	.....	4	....	17,500	no	no	.....	.....	937
5,462	.....	15 00	11 40	.....	.....	3	....	3,136	no	no	.....	.....	938
18,000	.....	18 00	12 00	.....	.....	1	....	600	10	....	10	.....	939
14,485	.....	.....	13 80	.....	.....	1	....	1,380	8	....	8	.....	940
50,505	.....	20 00	7 50	.....	.....	2	....	1,620	no	no	.....	.....	941
3,000	.....	18 00	12 00	.....	.....	....	....	.....	.....	....	.....	.....	942

INDUSTRIES.—TABLE NO. 32.

23,826	.....	19 20	14 40	.....	.....	9	1	12,162	10	....	10	.....	943
2,080	3,360	12 00	.....	5 00	.....	1	2	3,364	20	....	20	.....	944
5,000	3,300	17 40	9 00	6 00	.....	2	1	3,060	7	....	7	.....	945
23,000	15,000	.....	.....	.....	.....	2	3	.....	10	....	10	.....	946
69,368	.....	.....	.....	.....	.....	9	11	23,153	no	no	.....	.....	949
4,500	.....	.....	.....	.....	.....	2	....	2,500	no	no	.....	.....	947
6,260	3,627	18 00	.....	.....	9 00	7	3	12,589	yes	....	yes	.....	948
16,542	.....	16 50	12 00	.....	.....	4	....	7,189	.....	1	1	.....	950
.....	.....	15 00	7 50	.....	.....	....	....	.....	no	no	.....	.....	951

WAGES AND THEIR PROPORTION TO PRODUCT.

As 103 of the establishments included in the previous tables omit necessary details, there are only 850 given in the following tables which show the annual and daily wages paid in the various industries and the proportion they bear to the amount of the gross product. In the average percentage of wages to product there has been an increase of 28 per cent. as compared with the previous year.

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.

LUMBER MANUFACTURERS.—TABLE NO. 1.

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
1	2	120	200	2,100	100 00	83	10	90	1
2	89	150	40,600	135,000	456 18	3 04	30	70	2
3	301	225	100,000	250,000	332 23	1 48	40	60	3
4	20	15	600	3,000	30 00	2 00	20	80	4
6	16	70	2,850	7,500	178 12	2 54	38	62	6
7	22	312	8,100	10,000	372 77	1 19	81	19	7
8	410	365	22,000	96,000	536 51	1 48	22	78	8
10	28	300	16,236	35,000	579 81	1 93	46	54	10
11	16	200	7,146	16,000	446 62	2 23	44	56	11
12	10	305	3,000	15,000	300 00	98	20	80	12
13	30	120	4,000	22,000	133 33	1 11	18	82	13
14	15	100	1,500	6,000	100 00	1 00	25	75	14
15	3	90	360	3,500	120 00	1 30	10	90	15
16	1	270	600	1,400	600 00	2 12	40	60	16
17	52	305	16,500	30,000	317 31	1 04	55	45	17
18	155	160	44,800	80,000	289 30	1 81	56	44	18
19	6	200	2,000	6,000	333 33	1 67	33	67	19
20	4	60	250	2,000	62 50	1 04	13	87	20
21	10	125	2,115	9,503	211 50	1 69	23	77	21
23	21	220	4,511	10,000	214 81	97	45	55	23
24	122	100	27,250	124,771	223 36	2 23	22	78	24
26	32	313	11,480	34,234	358 75	1 14	34	66	26
27	18	150	10,000	40,000	555 50	3 70	25	75	27
30	53	200	18,000	150,000	339 43	1 70	12	88	30
31	7	203	2,842	10,000	406 00	2 00	28	72	31
32	9	313	2,740	15,000	304 44	97	18	82	32
34	255	312	131,580	250,000	516 00	1 65	52	48	34
35	3	12	720	1,500	260 00	2 16	48	52	35
36	66	250	26,600	150,000	403 30	1 61	18	82	36
37	56	300	38,126	184,470	684 39	2 28	21	79	37
38	7	313	5,000	13,000	714 29	2 28	39	61	38
39	84	300	54,000	100,000	645 29	2 15	54	46	39
40	69	120	24,400	50,000	339 13	2 83	49	51	40
41	10	100	5,000	6,000	500 00	5 00	83	17	41
42	3	150	600	2,000	200 00	1 33	30	70	42
43	6	100	2,700	15,000	450 00	4 50	19	81	43
44	139	300	34,209	139,095	246 11	82	25	75	44
45	516	150	208,000	840,000	403 10	2 69	25	75	45
46	19	265	6,820	20,000	358 95	1 43	34	66	46

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

LUMBER MANUFACTURERS.—TABLE NO. 1.—*Continued.*

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
47	171	290	138,000	590,000	807 11	2 09	23	77	47
48	21	100	5,300	14,000	252 33	2 53	38	62	48
49	204	175	98,235	699,592	481 54	2 75	14	86	49
50	20	200	5,600	22,000	280 00	1 40	25	75	50
54	306	300	134,735	333,230	440 31	1 47	40	60	54
55	39	305	18,500	50,000	474 36	1 55	37	63	55
56	567	305	224,393	600,000	395 75	1 30	37	63	56
58	168	310	77,443	663,405	460 97	1 45	12	88	58
59	3	250	1,200	4,500	400 00	1 60	27	73	59
60	20	130	6,000	30,000	300 00	2 31	20	80	60
61	2	250	900	8,000	450 00	1 80	11	89	61
62	5	150	750	4,000	150 00	1 00	19	81	62
63	81	175	25,400	100,000	313 58	1 79	25	75	63
64	31	300	12,000	60,000	387 91	1 29	20	80	64
65	4	160	1,000	6,000	250 00	1 56	11	89	65
66	8	20	520	6,500	65 00	3 29	9	91	66
67	23	116	6,773	40,000	294 48	2 54	17	83	67
68	80	175	15,000	30,000	187 50	1 07	50	50	68
69	17	275	4,535	9,000	266 76	97	50	50	69
71	10	180	2,250	6,500	225 00	1 25	38	62	71
72	1	50	75	400	75 00	1 50	19	81	72
73	65	200	35,000	130,000	523 71	2 62	27	73	73
75	16	72	4,476	25,000	279 75	3 88	18	82	75
76	244	181	109,852	467,245	450 21	2 49	24	76	76
78	12	250	4,500	18,000	373 33	1 49	25	75	78
79	71	300	44,849	290,000	631 53	2 11	15	85	79
80	15	300	8,400	150,000	560 00	1 87	5	95	80
81	15	300	7,800	80,000	520 00	1 73	10	90	81
82	48	300	17,000	25,000	354 38	1 18	64	36	82
83	312	300	165,000	692,000	528 85	1 76	24	76	83
84	139	184	59,500	460,000	428 51	2 32	13	87	84
85	52	200	28,500	125,000	548 71	2 74	23	77	85
86	102	310	40,700	90,000	399 11	1 29	45	55	86
87	127	150	51,463	300,000	405 22	2 70	17	83	87
88	155	180	134,500	425,000	867 74	4 82	32	68	88
89	7	120	2,700	10,000	385 63	3 21	27	73	89
90	15	100	3,500	14,000	233 33	2 33	25	75	90
91	26	300	10,300	50,000	396 16	1 32	21	79	91
93	12	200	4,500	18,000	375 00	1 88	25	75	93
94	10	310	4,000	15,000	400 00	1 30	27	73	94
	5,912	average 206	2,403,944	9,546,440	average 368 04	average 1 92	average 29	average 71	

PLANING MILLS, SASH AND DOOR FACTORIES, ETC.—TABLE NO. 2.

95	472	289	143,600	300,000	304,24	1 05	47	53	95
96	41	310	27,600	53,000	673 17	2 24	52	48	96
97	50	300	32,669	182,788	653 38	2 11	18	82	97
99	53	300	32,700	155,000	619 98	2 06	21	79	99
100	205	300	71,300	250,000	347 81	1 16	28	72	100
101	5	313	2,200	12,000	440 00	1 41	18	82	101
102	23	313	22,496	175,000	978 80	3 13	13	87	102

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

PLANING MILLS, SASH AND DOOR FACTORIES, ETC.—TABLE NO. 2.—*Continued.*

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
103	5	250	2,500	8,000	500 00	2 00	31	69	103
105	17	313	9,050	63,000	532 35	1 70	14	86	105
106	55	300	34,000	120,000	618 18	2 06	28	72	106
107	23	313	11,600	20,000	504 35	1 61	58	42	107
108	70	303	26,298	125,146	375 81	1 21	21	79	108
109	5	200	2,000	10,000	400 00	2 00	20	80	109
112	4	235	1,950	12,000	487 50	2 08	16	84	112
113	65	300	55,644	96,460	856 60	2 85	57	43	113
114	213	300	133,900	452,000	628 64	2 10	30	70	114
115	22	290	22,000	40,000	1,000 00	3 45	55	45	115
116	23	312	17,200	60,000	747 83	2 40	29	71	116
118	20	305	17,928	230,824	896 40	2 94	8	92	118
119	7	120	5,000	8,000	714 28	5 95	62	38	119
120	102	308	55,202	301,800	541 19	1 76	18	82	120
121	16	250	8,963	31,154	560 12	2 24	29	71	121
123	7	302	3,785	25,000	540 71	1 46	15	85	123
124	44	300	33,000	225,000	750 00	2 50	15	85	124
125	54	306	32,742	252,582	606 33	2 31	13	87	125
	1,601	Average 285	805,327	3,208,754	Average 611 11	Average 1 95	Average 29	Average 71	

WOODWORKING FACTORIES, SPECIALTIES IN WOODENWARE.—TABLE NO. 3.

128	44	265	12,300	35,000	279 54	1 05	35	65	128
129	14	30	1,000	5,000	71 43	2 38	20	80	129
130	97	300	39,200	165,000	404 16	1 35	24	76	130
132	43	300	28,646	203,000	666 18	2 22	14	86	132
133	90	300	37,033	150,000	411 47	1 37	25	75	133
134	4	260	923	4,304	230 75	85	23	77	134
135	50	300	27,400	40,000	548 80	1 83	68	32	135
136	46	280	19,106	40,000	411 00	1 47	48	52	136
137	34	300	12,200	21,000	358 91	1 19	58	42	137
138	130	288	67,472	210,000	518 11	1 90	32	68	138
140	32	200	12,904	31,000	403 25	2 01	42	58	140
141	20	275	14,000	35,000	700 00	2 58	40	60	141
142	50	300	23,800	55,000	476 00	1 59	43	57	142
144	22	311	11,800	26,500	536 35	1 72	45	55	144
145	6	305	2,820	5,730	470 00	1 54	56	44	145
146	264	300	28,487	98,000	107 91	36	29	71	146
147	22	275	12,550	110,000	570 45	2 07	11	89	147
148	22	305	20,800	60,000	940 90	3 08	35	65	148
149	125	312	50,000	135,000	400 00	1 28	37	63	149
152	6	300	5,000	12,000	833 33	2 78	41	59	152
153	41	295	26,500	82,000	646 34	2 16	32	68	153
154	57	304	45,151	60,000	792 12	2 61	75	25	154
155	70	300	30,936	185,000	441 94	1 48	17	83	155
156	15	300	7,500	30,000	500 00	1 67	25	75	156
157	25	275	17,500	50,000	700 00	2 55	35	65	157
158	160	295	95,569	376,726	597 31	2 01	25	75	158
159	5	290	3,000	5,000	600 00	2 07	60	40	159
160	14	300	10,393	40,000	740 93	2 47	26	74	160
161	154	301	97,055	113,714	630 20	2 09	86	14	161

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

WOODWORKING FACTORIES, SPECIALTIES IN WOODENWARE.—TABLE No. 3.—*Continued.*

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
162	31	305	8,652	88,000	279 91	92	10	90	162
163	11	276	12,827	16,127	1,166 90	4 23	80	20	163
164	84	241	53,232	70,138	633 71	2 63	75	25	164
165	108	305	52,120	197,000	482 59	1 58	26	74	165
166	23	305	13,775	30,000	598 91	1 97	46	54	166
167	4	208	1,456	10,000	364 00	1 75	15	85	167
168	41	300	22,000	25,000	536 59	1 79	88	12	168
169	12	305	5,984	8,385	498 66	1 64	74	26	169
170	5	300	4,000	7,700	800 00	2 67	57	43	170
171	11	310	7,070	30,613	642 73	2 07	23	77	171
172	95	275	60,108	275,000	632 72	2 30	22	78	172
173	16	310	11,878	73,209	742 38	2 39	16	84	173
175	26	300	9,000	30,000	346 16	1 16	30	70	175
176	46	300	20,297	93,000	441 24	1 47	22	78	176
177	3	250	1,494	2,840	498 00	1 99	74	26	177
178	23	300	9,360	55,200	406 96	1 36	17	83	178
179	5	270	2,200	3,500	440 00	1 63	73	27	179
180	54	300	21,106	38,511	392 70	1 31	53	47	180
	2,260	Average 283	1,077,602	3,438,197	Average 316 84	Average 1 84	Average 43	Average 57	

FURNITURE MANUFACTURERS; BANK AND OFFICE FITTINGS.—TABLE No. 4.

181	55	290	40,000	133,000	727 27	2 51	31	69	181
182	7	290	3,057	8,060	436 71	1 51	38	62	182
183	43	300	28,746	75,000	663 86	2 21	38	62	183
184	141	300	65,706	438,799	466 00	1 55	16	84	184
185	21	275	12,000	64,000	571 43	2 08	19	81	185
186	40	305	17,401	50,497	435 20	1 43	35	65	186
187	75	305	49,002	148,875	653 36	2 14	33	67	187
188	19	287	12,865	32,500	677 11	2 36	40	60	188
189	59	315	33,149	80,000	561 85	1 47	41	59	189
190	68	300	34,428	86,638	506 31	1 69	40	60	190
191	47	300	19,592	64,000	416 85	1 39	31	69	191
192	5	300	3,000	12,000	600 00	2 00	25	75	192
193	74	300	44,674	175,000	601 00	2 01	26	74	193
194	362	295	171,235	513,000	470 26	1 59	33	67	194
195	45	305	26,500	80,000	588 88	1 93	33	67	195
196	58	300	28,475	200,000	490 96	1 64	18	82	196
197	31	300	16,100	65,000	519 35	1 73	26	74	197
198	67	300	31,375	90,000	468 28	1 56	35	65	198
199	51	300	21,349	72,000	418 61	1 40	30	70	199
200	71	300	34,900	115,200	491 41	1 63	30	70	200
201	61	286	32,261	77,600	528 87	1 85	41	59	201
202	62	250	24,000	77,000	387 91	1 55	31	69	202
203	52	305	29,090	80,400	559 42	1 83	36	64	203
204	95	300	44,200	150,000	465 49	1 55	29	71	204
205	175	305	110,221	311,624	629 83	2 06	35	65	205
206	194	292	90,257	272,000	413 13	1 48	33	67	206
207	18	300	14,000	30,000	777 77	2 59	46	54	207
209	86	300	34,300	90,000	398 84	1 33	38	62	209
210	750	300	394,555	1,249,335	526 71	1 75	32	68	210

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

FURNITURE MANUFACTURERS, TABLE No. 4.—*Continued.*

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
211	250	275	124,160	298,448	496 64	1 81	42	58	211
212	123	300	57,600	225,000	460 16	1 53	25	75	212
213	75	313	45,803	115,228	610 71	1 95	40	60	213
214	94	300	61,241	177,381	651 50	2 17	35	65	214
215	376	300	220,500	475,000	586 44	1 95	47	53	215
216	52	300	26,903	53,000	511 59	1 37	51	49	216
217	133	300	60,800	180,000	449 63	1 50	34	66	217
218	43	300	22,319	76,980	519 41	1 73	28	72	218
219	30	300	11,650	25,000	388 33	1 23	46	54	219
220	51	275	26,114	91,724	512 31	1 86	29	71	220
221	12	275	5,760	30,000	480 00	1 75	19	81	221
222	64	300	36,000	100,000	562 50	1 88	36	64	222
223	120	300	82,750	295,000	689 58	2 30	28	72	223
224	43	300	26,000	69,000	604 65	2 02	38	62	224
225	12	300	7,500	20,000	625 00	2 08	37	63	225
226	98	300	63,815	176,359	651 17	2 17	36	64	226
227	165	303	67,602	190,000	409 77	1 35	35	65	227
228	76	300	38,822	165,350	510 82	1 70	24	76	228
229	10	300	3,680	16,000	368 00	1 23	23	77	229
230	34	290	15,301	30,000	450 00	1 55	51	49	230
	4,693	Average 297	2,470,758	7,650,998	Average 530 43	Average 1 77	Average 34	Average 66	

CARRIAGES AND OTHER VEHICLES AND PARTS, AND MOTORS.—TABLE No. 5.

231	10	300	12,000	25,000	1,200 00	4 00	48	52	231
232	1,031	300	678,266	7,500,000	657 86	2 19	9	91	232
234	188	313	190,819	2,322,640	1,014 99	3 24	9	91	234
235	58	308	34,637	206,438	597 19	1 91	17	83	235
238	14	304	7,957	24,500	568 36	1 87	33	67	238
239	122	300	66,500	175,000	545 10	1 82	38	62	239
240	2	90	250	5,000	125 00	1 49	5	95	240
241	13	300	5,200	24,000	400 00	1 33	22	78	241
242	16	300	7,100	35,000	443 75	1 48	20	80	242
243	84	300	48,500	170,000	577 38	1 92	29	71	243
244	320	300	177,000	500,000	553 13	1 84	35	65	244
245	66	300	38,716	177,329	586 61	1 96	22	78	245
246	22	275	14,000	50,000	636 36	2 31	28	72	246
247	61	300	21,000	85,000	344 26	1 15	25	75	247
248	365	300	169,500	760,000	464 38	1 55	22	78	248
249	83	308	44,133	110,739	531 72	1 73	40	60	249
250	26	300	15,000	52,000	576 92	1 92	29	71	250
251	55	300	29,010	118,639	527 46	1 76	25	75	251
252	163	280	101,760	428,624	624 29	2 23	24	76	252
253	3	300	1,200	4,000	400 00	1 33	30	70	253
254	39	280	15,500	50,000	397 44	1 42	31	69	254
255	16	275	10,500	45,000	656 25	2 39	23	77	255
256	675	294	351,402	626,391	520 59	1 77	54	46	256
	3,432	Average 288	2,039,950	13,495,300	Average 563 04	Average 1 94	Average 27	Average 73	

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

AGRICULTURAL IMPLEMENTS, DAIRY MACHINERY, ETC.—TABLE NO. 6.

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
257	12	280	6,700	32,000	558 33	1 99	21	79	257
258	36	300	23,597	50,000	683 25	2 28	47	53	258
259	4	300	2,288	6,000	572 00	1 91	38	62	259
260	133	300	82,976	216,116	623 81	2 08	38	62	260
261	30	250	16,900	37,500	563 33	2 25	46	54	261
262	83	280	53,000	215,000	638 55	2 28	25	75	262
264	39	313	13,334	35,000	341 89	1 09	38	62	264
265	49	275	30,000	91,000	612 25	2 22	33	67	265
266	12	303	7,389	70,140	615 75	2 03	11	89	266
268	390	224	233,328	642,669	572 64	2 56	36	64	268
269	95	305	42,500	350,000	447 37	1 47	12	88	269
270	235	310	141,000	500,000	600 00	1 94	28	62	270
271	53	310	33,000	75,000	622 64	2 01	44	56	271
272	188	309	126,392	361,745	672 30	2 17	35	65	272
	1,359	Average 254	811,404	2,682,170	Average 507 76	Average 1 77	Average 28	Average 72	

PIANO, ORGAN AND MUSICAL INSTRUMENT FACTORIES.—TABLE NO. 7.

273	80	305	64,929	238,251	811 61	2 66	27	73	273
274	2	300	900	4,499	450 00	1 50	23	77	274
275	34	309	20,700	150,000	608 82	2 03	14	86	275
276	67	300	26,500	120,000	395 52	1 32	22	78	276
277	33	300	16,150	34,200	489 39	1 63	47	53	277
278	247	313	140,934	385,128	570 99	1 86	36	64	278
279	33	300	24,213	85,288	733 73	2 45	29	71	279
	496	Average 303	294,326	1,017,366	Average 580 01	Average 1 92	Average 28	Average 72	

WOOD-PULP FACTORIES, PAPER MILL, STATIONERY.—TABLE NO. 8.

280	23	250	9,300	32,000	404 35	1 62	29	71	280
281	21	305	9,300	30,000	442 86	1 45	31	69	281
282	23	80	1,391	8,771	60 48	76	17	83	282
283	27	210	9,500	60,000	351 85	1 68	16	84	283
284	38	313	14,674	50,000	386 16	1 23	29	71	284
285	52	300	24,175	62,365	464 90	1 55	39	61	285
286	3	60	1,015	10,000	338 33	5 64	10	90	286
287	165	300	61,250	450,000	371 21	1 23	14	86	287
288	44	205	24,896	185,000	565 82	2 76	14	86	288
289	17	300	6,166	46,000	361 53	1 21	13	87	289
290	168	300	57,000	231,000	345 24	1 15	25	75	290
291	9	300	2,825	10,000	313 88	1 04	28	72	291
292	26	260	8,950	35,000	344 23	1 33	26	74	292
293	77	300	54,933	140,751	713 43	2 38	32	68	293
294	23	300	12,760	30,000	554 78	1 85	42	58	294
295	211	280	106,701	659,889	505 69	1 45	16	84	295
296	40	270	23,257	87,800	581 43	2 15	27	73	296
297	75	300	34,627	178,000	461 69	1 54	20	80	297

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

WOOD PULP FACTORIES, PAPER MILL, STATIONERY.—TABLE No. 8.—*Continued*

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
298	33	300	19,000	75,000	575 75	1 92	25	75	298
299	42	313	22,293	83,500	530 79	1 70	26	74	299
300	36	231	24,894	108,700	691 50	2 99	23	77	300
301	58	300	33,150	118,000	571 55	1 91	29	71	301
302	131	300	70,261	433,507	536 34	1 79	16	84	302
	1,342	Average 264	632,328	3,065,283	Average 455 38	Average 1 84	Average 19	Average 81	

FOUNDRIES, ROLLING MILLS, BRIDGE AND STRUCTURAL IRON.—TABLE No. 9.

303	4	300	2,455	6,500	613 75	2 05	41	59	303
304	515	304	514,364	1,720,576	998 76	3 28	30	70	304
306	99	300	51,744	125,000	522 67	1 74	41	69	306
307	120	300	88,833	197,974	740 27	2 47	46	54	307
308	16	300	9,200	28,000	575 00	1 92	33	67	308
309	111	300	84,508	200,000	761 33	2 54	42	58	309
310	161	230	136,900	552,000	850 31	3 70	25	75	310
311	39	297	27,985	40,000	709 95	2 73	70	30	311
312	135	300	90,536	202,933	685 45	2 28	45	55	312
313	35	300	14,600	50,000	411 43	1 37	29	71	313
314	36	308	18,455	43,121	513 17	1 67	43	57	314
315	6	302	3,656	10,527	609 33	2 02	36	64	315
316	648	305	477,825	917,263	737 38	2 42	52	48	316
317	6	313	3,000	11,000	500 00	1 60	27	73	317
318	38	296	22,953	156,000	603 23	2 04	15	85	318
320	329	325	232,000	500,000	705 14	2 14	41	59	320
321	38	300	22,949	52,000	603 99	2 01	44	56	321
322	47	300	32,828	167,000	698 44	2 33	20	80	322
323	48	300	25,200	43,000	525 00	1 75	59	41	323
324	55	100	41,794	130,079	759 71	7 59	32	68	324
325	5	300	3,650	9,000	730 00	2 43	41	59	325
326	21	295	10,359	32,936	493 29	1 67	32	68	326
327	306	300	177,766	765,000	580 91	1 94	23	77	327
329	68	304	53,282	182,000	783 56	2 58	29	71	329
330	159	284	81,943	538,792	509 71	1 80	15	85	330
331	19	310	8,440	20,000	444 21	1 43	42	58	331
332	4	310	1,500	5,000	375 00	1 21	30	70	332
333	39	310	19,420	53,273	497 69	1 61	37	63	333
	3,107	Average 283	2,258,145	6,758,974	Average 604 78	Average 2 22	Average 35	Average 65	

STOVE MANUFACTURERS, HOT AIR FURNACES AND HEATING APPARATUS.—TABLE No. 10.

335	119	300	99,321	210,000	835 40	2 79	47	53	335
336	125	300	81,000	157,000	648 00	2 19	51	49	336
337	377	282	186,006	852,393	493 38	1 75	22	78	337
338	209	305	111,150	325,000	531 82	1 74	34	66	338
339	5	300	3,700	12,000	740 00	2 47	41	59	339

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

STOVE MANUFACTURERS, HOT AIR FURNACES AND HEATING APPARATUS.
TABLE No. 10.—*Continued.*

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
340	29	300	9,500	74,708	327 58	1 09	13	87	340
341	53	290	46,879	108,000	884 34	3 05	43	57	341
342	30	300	21,380	57,000	712 66	2 38	38	62	342
343	940	275	600,000	2,000,000	638 30	2 36	30	70	343
344	246	283	151,879	310,000	634 47	2 24	50	50	344
345	119	250	69,610	165,686	584 87	2 33	42	58	345
346	49	300	33,600	100,000	685 71	2 30	34	66	346
347	48	300	36,800	75,000	766 67	2 56	48	52	347
348	39	250	16,700	60,000	428 21	1 71	28	22	348
	2,388	Average 288	1,467,525	4,506,787	Average 635 81	Average 2 21	Average 36	Average 64	

ENGINE, BOILER AND MACHINERY FACTORIES, ENGINEERS' MACHINE SHOPS.—
TABLE No. 11.

350	84	240	35,696	100,980	424 95	1 77	15	85	350
351	22	320	15,250	30,000	693 19	2 17	51	49	351
352	11	300	5,700	18,000	518 18	1 73	32	68	352
353	447	300	280,000	737,000	624 09	2 06	38	62	353
354	53	305	45,200	75,000	852 83	2 79	60	40	354
355	13	300	7,574	39,670	582 61	1 94	19	81	355
356	43	300	44,500	170,000	1,034 88	3 45	26	74	356
357	8	313	5,230	65,000	653 75	2 09	8	92	357
358	60	305	10,717	29,116	177 33	58	10	90	358
359	9	313	9,100	50,000	1,011 11	8 85	18	82	359
360	6	300	5,800	7,000	966 66	3 22	82	18	360
361	33	300	17,800	57,000	539 39	1 80	31	69	361
362	28	305	16,960	63,218	605 71	1 99	27	73	362
363	50	300	30,468	168,869	609 36	2 09	18	62	363
364	19	300	9,993	11,780	525 95	1 75	90	10	364
365	19	305	12,080	30,351	635 79	2 08	40	60	365
368	22	300	17,796	46,371	808 91	2 70	39	61	368
369	28	300	17,624	42,380	629 43	2 10	42	58	369
370	11	305	5,719	15,800	519 99	1 71	38	62	370
371	32	309	16,350	30,000	510 31	1 68	54	46	371
372	8	287	7,228	6,722	903 50	3 15	.....	.....	372
373	19	305	19,906	81,893	1,052 42	3 45	25	75	373
374	235	300	133,313	400,000	524 31	1 75	38	62	374
375	33	300	18,411	38,447	557 91	1 86	48	52	375
376	21	300	16,174	38,000	770 19	2 57	43	57	376
377	7	300	3,100	30,000	442 86	1 48	10	90	377
378	103	175	39,000	70,000	378 64	2 16	55	45	378
379	5	310	6,000	20,000	1,200 00	3 87	30	70	379
380	4	313	2,800	4,000	500 00	1 60	50	50	380
381	154	309	98,388	261,295	638 88	2 07	38	62	381
382	86	300	38,741	91,752	450 49	1 51	42	58	382
383	16	268	11,321	17,536	707 56	2 64	66	34	383
384	30	300	19,676	152,000	655 87	2 19	13	87	384
385	185	305	112,886	313,000	610 19	2 00	36	64	385
386	2	150	150	1,000	75 00	50	15	85	386
387	7	305	3,941	11,000	563 00	1 85	36	64	387
388	23	300	19,500	100,000	847 87	2 80	19	81	388

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

ENGINE, BOILER AND MACHINERY FACTORIES, ENGINEER'S MACHINE SHOP.—TABLE No. 11.—*Continued.*

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
389	505	300	354,864	2,013,051	702 70	2 34	17	83	389
390	12	300	10,444	24,000	870 33	2 90	43	57	390
391	42	292	26,260	100,000	625 24	2 48	26	74	391
392	20	305	23,500	38,000	1,175 00	3 85	61	39	392
393	128	305	94,155	187,213	735 59	2 08	50	50	393
394	33	300	19,000	60,000	575 78	1 92	31	69	394
395	454	305	226,000	468,000	497 80	1 63	46	54	395
396	8	300	6,500	12,000	812 50	2 71	54	46	396
397	27	301	17,972	46,913	665 63	2 21	39	61	397
398	17	305	12,221	30,000	718 88	2 36	41	59	398
399	290	305	201,556	605,000	695 20	2 26	33	67	399
400	4	300	2,850	6,000	712 50	2 38	47	53	400
401	39	302	20,340	48,068	521 54	1 73	42	58	401
402	44	300	24,513	98,000	557 11	1 86	25	75	402
403	15	300	5,988	16,500	399 20	1 33	37	63	403
404	24	296	9,400	58,000	391 66	1 32	16	84	404
405	76	300	66,122	147,000	870 21	2 90	45	55	405
406	65	300	30,000	125,000	461 55	1 54	24	76	406
407	70	299	31,360	120,000	442 28	1 48	26	74	407
408	56	300	31,776	75,298	562 70	1 88	42	58	408
409	11	280	6,329	32,850	575 36	2 05	20	80	409
410	10	310	8,032	10,000	803 20	2 59	80	20	410
411	6	300	3,239	20,161	539 83	1 80	16	84	411
413	10	312	6,002	24,141	600 20	1 92	24	76	413
414	80	300	61,932	120,000	774 15	2 48	51	49	414
415	38	70	3,600	6,000	94 74	1 35	60	40	415
416	11	320	4,140	12,000	376 36	1 18	34	66	416
	4,031	Average 293	1,308,095	4,503,195	Average 618 13	Average 2 23	Average 36	Average 64	

METALLIC ROOFING AND LIGHT IRONWARE.—TABLE No. 12.

418	4	300	3,600	5,000	900 00	3 00	72	28	418
419	5	250	2,008	3,000	401 60	1 61	67	33	419
420	7	300	3,800	21,000	542 86	1 81	18	82	420
421	49	200	18,500	63,000	377 55	1 89	29	71	421
422	26	305	14,700	65,000	565 38	1 85	23	77	422
423	12	300	4,836	35,000	403 00	1 34	13	87	423
424	44	305	23,300	70,000	529 54	1 41	33	67	424
425	58	308	19,972	80,000	344 00	1 12	25	75	425
426	7	270	4,605	15,000	657 85	2 44	30	70	426
427	59	308	46,553	121,056	787 34	2 56	39	61	427
428	44	254	10,382	56,513	235 95	0 97	18	82	428
429	10	305	4,800	15,000	480 00	1 57	32	68	429
430	46	306	32,992	145,000	717 21	2 35	23	77	430
431	75	306	26,788	120,000	355 84	1 16	22	78	431
432	341	300	206,100	673,768	610 26	2 03	31	69	432
433	10	313	7,500	16,000	750 00	2 40	47	53	433
434	18	300	10,000	18,000	555 50	1 85	55	45	434

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

METALLIC ROOFING AND LIGHT IRONWARE.—TABLE NO. 12.—*Continued*

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
436	34	300	15,250	35,000	448 53	1 50	44	66	436
437	22	300	13,894	21,818	631 55	2 11	66	44	437
438	39	275	19,928	55,000	510 97	1 49	36	64	438
439	288	300	224,882	370,000	780 84	2 60	61	39	439
440	216	315	125,537	889,682	581 19	1 85	14	86	440
441	35	250	18,553	242,849	530 81	2 12	8	92	441
442	5	310	5,559	15,555	1,111 80	3 51	37	63	442
443	340	305	138,502	859,843	407 36	1 34	16	84	443
444	9	310	9,770	24,695	1,085 55	3 50	41	59	444
445	2	310	1,500	30,000	750 00	2 42	5	95	445
446	37	300	22,300	75,000	602 70	2 01	30	70	446
447	171	300	75,000	165,000	438 59	1 46	45	55	447
448	23	278	17,053	50,000	732 30	2 63	34	66	448
449	44	310	19,028	67,000	432 45	1 40	29	71	449
450	139	300	71,275	140,000	512 77	1 71	51	49	450
451	23	300	14,511	33,000	630 91	2 10	44	56	451
	2,242	Average 294	1,232,975	4,496,779	Average 587 95	Average 1 97	Average 35	Average 65	

WIRE FENCE, WIRE ROPE AND WIRE CLOTH FACTORIES.—TABLE NO. 13.

453	11	306	6,315	20,000	574 90	1 88	32	68	453
454	10	300	7,617	20,787	761 70	2 21	38	62	454
455	154	300	115,247	690,010	748 23	2 49	23	77	455
456	77	300	78,380	333,000	1,017 92	3 06	23	77	456
457	16	305	13,245	63,000	827 81	2 06	23	77	457
458	41	300	20,500	60,000	500 00	1 66	34	66	458
460	25	300	15,550	106,908	622 00	2 07	14	86	460
461	19	300	12,127	147,673	638 26	2 13	8	92	461
462	12	200	4,843	20,094	403 58	2 02	24	76	462
463	187	305	88,383	1,734,497	477 98	1 57	5	95	463
464	336	273	216,740	776,231	645 60	2 37	28	72	464
465	103	307	38,494	469,755	373 73	1 22	8	92	465
466	15	260	11,594	71,961	772 93	2 97	16	84	466
	1,006	Average 289	629,035	4,513,916	Average 641 12	Average 2 13	Average 21	Average 79	

BRASS AND COPPER WARE FACTORIES AND PLUMBERS' SUPPLIES.—TABLE NO. 14.

467	109	313	81,802	502,368	750 48	2 40	16	84	467
468	39	156	12,017	100,000	308 13	1 91	12	88	468
469	66	300	26,658	67,130	403 76	1 35	35	65	469
470	69	280	54,946	125,000	781 83	2 79	44	66	470
471	10	289	9,500	26,500	950 00	3 29	36	64	471
472	35	305	21,401	29,327	611 57	2 01	70	30	472
473	32	312	17,500	56,000	546 87	1 75	13	87	473
474	79	300	34,640	122,961	438 48	1 46	28	72	474
475	168	300	114,807	225,000	683 32	2 21	51	49	475

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued*

BRASS AND COPPER WARE FACTORIES AND PLUMBERS' SUPPLIES.—TABLE NO. 14.—*Continued.*

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
476	100	300	75,000	217,000	750 00	2 50	35	65	476
477	66	300	36,800	113,000	554 55	1 85	32	68	477
478	17	304	13,209	219,864	777 00	2 56	6	94	478
479	49	300	29,275	54,500	597 45	1 99	54	46	479
481	18	305	13,995	102,000	777 50	2 55	14	86	481
482	231	300	168,000	650,000	727 27	2 42	26	74	482
483	83	300	44,574	190,000	537 31	1 79	24	76	483
	1,171	Average 291	754,124	2,800,650	Average 637 22	Average 2 18	Average 30	Average 70	

SILVER-PLATED WARE AND JEWELLERY FACTORIES.—TABLE NO. 15.

484	150	293	114,745	476,000	764 97	2 61	24	76	484
485	10	300	8,018	15,160	801 80	2 67	51	49	485
486	149	294	73,825	278,764	462 58	1 57	27	63	486
487	28	300	15,900	50,000	567 86	1 56	32	68	487
488	130	300	101,190	166,194	777 77	2 59	61	39	488
489	9	300	2,212	4,000	245 77	82	55	45	489
490	15	300	9,141	38,704	609 40	2 03	24	76	490
491	156	285	119,650	463,618	766 98	2 69	26	74	491
	647	Average 296	444,681	1,492,440	Average 624 64	Average 2 07	Average 38	Average 62	

WOOLLEN, COTTON, LINEN AND YARN MILLS.—TABLE NO. 16.

492	81	225	5,600	8,900	69 14	31	70	30	492
494	37	288	13,320	57,000	360 00	1 25	23	77	494
495	33	300	12,000	100,000	363 63	1 21	12	88	495
496	42	305	17,500	80,000	416 66	1 37	22	78	496
497	8	305	4,600	25,211	575 00	1 90	18	82	497
498	243	278	62,738	350,000	258 18	93	18	82	498
499	13	260	4,990	45,000	383 84	1 48	11	89	499
500	27	200	14,600	75,000	540 74	2 20	19	81	500
501	95	280	31,428	117,000	330 82	1 18	27	73	501
502	12	349	9,535	20,015	794 54	2 28	47	53	502
503	19	160	4,000	14,000	210 52	1 32	29	71	503
504	2	36	350	2,000	175 00	4 86	17	83	504
505	13	300	4,780	16,000	752 31	2 51	61	39	505
507	2	200	1,600	5,000	800 00	4 00	30	70	507
509	534	300	247,000	1,000,000	465 58	1 54	25	75	509
510	6	300	3,000	20,000	500 00	1 67	15	85	510
512	279	250	106,190	380,000	380 61	1 52	28	72	512
513	42	300	15,000	75,000	380 95	1 27	20	80	513
514	5	300	3,050	20,000	610 00	2 03	15	85	514
515	4	290	1,590	7,000	397 50	1 37	23	77	515
516	12	300	6,075	35,000	506 25	1 69	17	83	516
517	38	270	19,300	75,000	507 89	1 84	26	74	517
518	23	300	5,200	25,000	226 81	76	21	79	518

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

WOOLLEN, COTTON, LINEN AND YARN MILLS.—TABLE NO 16—*Continued.*

Schedule No	Number of persons employed.	Number of days in operation	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
520	1,083	304	426,070	1,880,000	393 42	1 29	23	77	520
521	360	303	153,039	677,000	425 11	1 40	23	77	521
522	25	305	7,800	30,000	312 00	1 02	26	74	522
523	49	300	18,000	70,000	367 55	1 22	26	74	523
524	51	300	19,800	75,000	388 23	1 29	29	71	524
525	10	120	1,750	3,000	175 00	1 46	58	42	525
526	4	300	1,400	5,000	350 00	1 17	28	72	526
527	149	310	57,261	339.924	383 62	1 24	17	83	527
528	20	290	8,715	46,000	435 75	1 50	19	81	528
529	40	119	5,208	8,000	130 20	1 18	65	35	529
530	21	280	12,236	120,000	632 29	2 25	11	89	530
531	16	250	6,526	15,750	407 87	1 63	43	57	531
532	134	300	69,140	196,787	516 79	1 72	35	65	532
	3,522	Average 266	1,286,389	6,008,587	Average 404 34	Average 1 60	Average 28	Average 72	

KNITTED GOODS FACTORIES AND WOMEN'S UNDERWEAR.—TABLE NO. 17.

534	121	291	43,874	221,059	362 59	1 24	20	80	534
535	330	300	175,480	692,400	531 76	1 77	25	75	535
536	560	280	241,012	800,000	430 38	1 54	30	70	536
537	70	305	15,277	59,560	218 24	71	26	74	537
538	4	313	693	15,000	173 25	55	4	96	538
539	133	300	54,000	200,000	406 10	1 35	27	73	539
540	70	300	64,000	126,000	914 29	3 05	51	49	540
541	150	284	56,000	287,000	306 99	1 05	17	83	541
542	328	313	155,640	2,400,000	474 21	1 52	7	93	542
543	35	290	9,091	31,000	259 46	89	29	71	543
544	34	300	12,175	82,000	358 81	1 20	15	85	544
545	104	280	33,752	130,000	324 54	1 16	26	74	545
546	17	300	10,000	35,000	588 23	1 96	28	72	546
547	202	300	70,500	310,000	344 51	1 15	23	77	547
548	27	300	18,649	65,163	690 71	2 30	29	71	548
549	37	300	11,918	68,163	322 11	1 70	18	82	549
550	2,450	284	947,000	4,071,633	345 12	1 21	23	77	550
551	56	300	19,698	90,000	351 75	1 17	22	78	551
552	32	300	15,000	69,000	468 75	1 56	22	88	552
	4,760	Average 297	1,953,759	9,752,978	Average 414 28	Average 1 43	Average 23	Average 77	

CLOTHING FACTORIES, MEN'S AND WOMEN'S WHITEWEAR. MILLINERY.—TABLE NO. 18.

553	74	295	24,030	175,000	330 14	1 12	13	87	553
554	80	275	40,356	80,454	504 45	1 71	50	50	554
556	14	312	6,331	56,000	452 22	1 45	11	89	556
557	38	300	13,000	60,000	342 11	1 14	22	78	557
558	57	294	14,000	50,200	245 63	84	28	72	558
559	157	305	68,195	185,000	433 73	1 42	37	63	559
561	100	275	20,000	180,000	200 00	72	11	89	561
562	83	300	42,004	93,159	506 71	1 69	45	55	562

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

CLOTHING FACTORIES, MEN'S AND WOMEN'S WHITEWEAR, MILLINERY.—TABLE NO. 18.
—Continued.

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
563	44	300	33,000	100,000	763 64	2 55	33	67	563
564	10	300	4,200	15,000	420 00	1 40	28	72	564
565	100	295	49,235	100,000	492 35	1 67	49	51	565
566	21	300	7,561	25,000	360 49	1 20	30	70	566
567	96	300	37,275	235,000	388 28	1 29	16	84	567
568	208	300	87,714	353,900	421 70	1 41	25	75	568
569	214	310	152,907	377,599	714 52	2 28	43	57	569
570	135	300	9,400	21,000	69 63	23	44	56	570
571	74	250	47,799	150,000	645 93	2 58	32	68	571
572	47	250	21,389	125,000	461 47	1 85	18	82	572
573	28	225	15,050	60,000	537 50	2 39	26	74	573
574	81	275	38,100	150,000	470 37	1 71	22	78	574
575	122	313	65,000	225,000	532 79	1 70	29	71	575
	1,783	Average 289	796,846	2,817,312	Average 442 55	Average 1 54	Average 28	Average 72	

BOOT AND SHOE MANUFACTURING, FELT FOOTWEAR.—TABLE NO. 19.

576	46	300	22,000	111,092	478 26	1 59	20	80	576
577	92	300	38,500	250,000	418 48	1 40	15	85	577
578	63	300	26,150	150,000	415 71	1 46	17	83	578
579	29	285	10,480	58,000	361 38	1 27	18	82	579
580	396	265	188,055	1,153,463	500 14	1 89	16	84	580
581	132	313	86,000	500,000	651 52	2 08	17	83	581
582	72	277	35,457	229,900	492 46	1 78	15	85	582
583	3	313	700	6,000	233 33	74	12	88	583
584	80	290	37,100	171,500	463 75	1 60	21	79	584
585	32	300	15,800	70,000	493 75	1 65	22	78	585
586	20	300	21,500	48,000	1075 00	3 58	43	57	586
587	3	305	400	600	133 33	49	7	93	587
588	370	260	175,000	1,250,000	472 70	1 82	14	86	588
589	157	280	93,239	323,450	593 81	2 12	29	71	589
590	11	240	4,480	30,000	407 27	1 61	12	88	590
591	78	300	37,700	101,721	483 31	1 61	37	63	591
592	92	280	44,000	150,000	478 26	1 71	29	71	592
593	50	297	17,365	75,000	347 30	1 17	23	77	593
594	93	300	37,662	114,400	404 97	1 35	33	67	594
595	39	300	20,600	78,000	528 21	1 76	26	74	595
	1,858	Average 293	912,188	4,821,126	Average 421 40	Average 1 61	Average 21	Average 79	

FUR MANUFACTURERS, DRESSERS AND DYERS, HAT AND CAP FACTORIES —TABLE NO. 20.

597	25	305	9,900	40,000	356 00	1 17	25	75	597
599	10	308	4,195	60,000	419 50	1 36	30	70	599
	35	Average 307	14,095	100,000	Average 387 75	Average 1 27	Average 28	Average 72	

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

TANNERS, HARNESS AND LEATHER GOODS FACTORIES.—TABLE No. 21.

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c	$ c.	%	%	
601	12	275	5,013	62,200	417 75	1 52	8	92	601
603	182	300	94,554	1,077,074	510 94	1 70	9	91	603
604	105	313	59,973	92,000	571 17	1 80	65	35	604
605	16	300	11,929	80,614	745 56	2 49	15	85	605
606	3	305	1,200	20,000	400 00	1 31	6	94	606
607	262	310	164,712	1,270,000	605 77	1 95	13	87	607
608	62	280	31,000	72,700	500 00	1 84	43	57	608
609	54	305	21,500	75,000	361 15	1 19	29	71	609
610	102	280	64,281	680,500	634 13	2 27	10	90	610
611	34	276	20,661	52,203	607 67	2 20	39	61	611
612	43	300	25,159	75,000	585 90	1 59	33	67	612
613	25	275	8,600	59,000	344 00	1 25	15	85	613
614	3	305	1,449	20,000	483 00	1 58	7	93	614
615	8	300	5,000	30,000	628 00	2 09	16	84	615
616	48	300	36,374	350,000	757 79	2 53	10	90	616
617	357	300	127,000	510,000	355 74	1 19	25	75	617
618	9	300	3,500	8,000	388 88	1 30	44	56	618
619	8	295	3,646	36,612	455 75	1 55	10	90	619
620	3	300	1,200	1,500	400 00	1 33	8	92	620
621	20	280	10,496	45,000	524 80	1 87	23	77	621
622	23	300	7,075	100,000	307 61	1 02	7	93	622
623	13	300	9,000	84.000	692 31	2 31	11	89	623
625	28	310	16,836	50,000	601 29	1 94	34	66	625
626	33	303	15,294	121,266	463 45	1 53	13	87	626
627	3	300	1,200	1,500	400 00	1 33	80	20	627
	1,456	Average 292	746,652	4,974,169	Average 509 71	Average 1 71	Average 23	Average 77	

FLOUR AND FEED MILLS, CEREAL FOOD FACTORIES.—TABLE No. 22.

628	8	150	2,500	12,000	312 50	2 08	21	79	628
629	11	300	9,799	297,338	890 82	2 97	30	70	629
630	2	275	960	10,775	480 00	1 75	10	90	630
631	17	290	7,350	108,000	432 35	1 49	40	60	631
633	18	300	7,000	182,363	388 88	1 30	38	62	633
634	4	300	2,200	46,600	550 00	1 83	41	59	634
635	3	305	1,800	42,000	600 00	1 97	4	96	635
636	51	300	33,400	600,000	654 90	2 18	6	94	636
637	4	305	2,100	60,000	525 00	1 72	4	96	637
638	3	300	1,500	40,000	500 00	1 67	4	96	638
639	3	300	4,100	50,000	1,366 66	4 56	8	92	639
640	10	290	6,731	96,422	673 10	2 32	7	93	640
641	10	300	7,206	102,508	720 60	2 40	7	93	641
642	3	305	2,000	30,000	666 66	2 19	7	93	642
643	2	305	985	58,058	492 50	1 61	2	98	643
646	26	305	15,600	300,000	600 00	1 97	5	95	646
648	1	305	734	22,684	734 00	2 41	4	96	648
651	10	305	8,342	220,000	834 20	2 73	38	62	651
652	17	365	10,000	300,000	588 24	1 61	3	97	652
653	7	300	4,020	50,000	574 28	1 91	8	92	653
654	83	300	37,500	93,035	451 81	1 17	40	60	654
655	4	253	2,400	16,000	600 00	2 37	15	85	655
657	3	300	1,800	60,000	600 00	2 00	3	97	657

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

FLOUR AND FEED MILLS, CEREAL FOOD FACTORIES.—TABLE No. 22—*Continued.*

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
658	5	300	3,000	22,000	600 00	2 00	14	86	658
661	12	300	9,079	106,037	756 58	2 52	9	91	661
662	7	310	4,240	85,250	605 71	1 95	5	95	662
663	2	310	1,350	35,000	675 00	2 18	4	96	663
664	2	200	1,000	6,000	500 00	1 67	17	83	664
665	3	300	1,355	35,000	451 66	1 51	4	96	665
666	84	306	48,750	2,000,000	580 36	1 99	2	98	666
667	31	300	18,872	306,000	608 77	2 03	6	94	667
668	7	200	3,200	15,000	457 14	2 29	21	79	668
669	17	305	12,680	205,000	745 88	2 45	6	94	669
670	2	310	1,200	12,000	600 00	1 94	10	90	670
671	3	270	1,600	65,000	533 33	1 93	3	97	671
672	4	307	1,715	70,080	428 75	1 40	3	97	672
673	7	300	4,400	250,000	628 57	2 10	2	98	673
674	52	310	44,880	200,000	863 71	2 97	22	78	674
675	11	300	7,336	156,379	666 91	2 22	5	95	675
678	7	310	3,150	100,000	450 00	1 45	3	97	678
679	276	300	230,595	8,219,602	835 49	2 79	3	97	679
680	6	306	3,451	82,001	575 17	1 88	4	96	680
681	5	310	2,828	75,000	565 60	1 86	4	96	681
682	6	306	3,359	78,000	559 83	1 83	4	96	682
683	26	306	22,900	500,000	880 77	2 88	5	95	683
684	1	310	450	35,000	450 00	1 45	1	99	684
685	4	300	2,288	39,453	572 00	1 91	6	94	685
686	3	250	950	30,000	316 66	1 27	3	97	686
687	55	300	18,820	700,000	336 73	1 12	3	97	687
688	2	306	1,248	31,200	624 00	2 04	4	96	688
690	1	300	400	2,500	400 00	1 33	2	98	690
691	3	265	2,000	35,000	666 66	2 52	6	94	691
692	18	302	9,564	172,591	531 33	1 76	6	94	692
693	5	200	3,000	37,000	600 00	3 00	8	92	693
694	10	300	7,220	125,000	722 00	2 41	6	94	694
695	3	300	1,120	20,000	373 35	1 24	6	94	695
696	6	300	4,100	14,000	683 33	2 28	29	71	696
697	27	300	18,500	600,000	685 18	2 28	3	97	697
699	6	250	3,700	77,000	616 66	2 47	5	95	699
700	17	300	8,500	200,000	500 00	1 67	4	96	700
701	48	292	37,367	215,661	799 31	2 74	18	82	701
703	8	300	4,800	75,000	600 00	2 00	7	93	703
705	48	280	30,000	800,000	625 81	2 24	4	96	705
708	6	312	2,500	75,000	416 66	1 34	3	97	708
713	11	300	5,375	150,000	488 64	1 63	4	96	713
714	10	300	4,000	40,000	400 00	1 33	10	90	714
715	9	310	6,300	40,000	700 00	2 26	16	84	715
716	9	304	5,000	62,000	555 55	1 50	9	91	716
717	5	300	2,800	27,000	560 00	1 87	10	90	717
718	2	285	864	27,800	432 00	1 51	3	97	718
720	2	300	650	8,000	325 00	1 06	8	92	720
722	9	263	6,251	64,000	694 55	2 64	10	90	722
723	2	250	900	17,040	450 00	1 80	5	95	723
725	414	305	218,286	4,046,909	527 24	1 76	6	94	725
727	6	300	1,850	100,000	308 33	1 03	2	98	727
	1,625	Average 289	999,770	23,288,286	Average 575 88	Average 1 97	Average 9	Average 91	

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT. --*Continued.*

Bakers, Bread, Biscuit and Confectioners.—Table No. 23.

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
729	81	300	31,766	101,000	392 17	1 31	31	69	729
730	61	365	43,371	199,836	711 00	1 95	22	78	730
731	14	300	8,700	30,000	621 43	2 07	29	71	731
732	416	300	190,000	900,000	456 97	1 52	21	79	732
733	225	310	183,284	827,847	814 60	2 63	22	78	733
734	205	300	110,200	829,434	537 56	1 79	14	86	734
735	50	300	24,537	100,000	490 74	1 64	25	75	735
	1,052	Average 311	591,858	2,988,117	Average 574 92	Average 1 84	Average 24	Average 76	

Canning, Pork Packing, Bacon Curing, Abattoirs.—Table No. 24.

736	129	175	25,520	51,489	197 76	1 13	50	50	736
737	110	300	25,632	225,100	231 20	77	12	88	737
738	20	310	9,700	106,500	485 00	1 56	9	91	738
739	129	175	19,000	150,000	147 21	90	13	87	739
741	31	300	22,250	400,000	717 74	2 39	6	94	741
744	117	90	11,821	72,000	101 31	1 13	15	85	744
745	21	21	660	3,000	31 43	1 49	22	78	745
746	14	280	12,610	40,000	900 71	3 22	31	69	746
747	122	75	9,500	60,000	78 68	1 05	16	84	747
748	16	45	500	2,000	31 25	69	25	75	748
749	16	26	510	2,000	31 88	1 23	26	74	749
750	61	300	40,237	1,208,069	659 62	2 20	3	97	750
751	17	300	5,500	50,000	323 53	1 08	11	89	751
752	58	150	13,500	65,000	232 76	1 55	21	79	752
753	72	140	9,500	54,000	131 94	94	18	82	753
754	28	310	17,600	75,000	628 57	2 03	23	77	754
755	121	150	21,500	50,000	177 71	1 19	43	57	755
756	376	200	251,500	10,000,000	668 88	3 34	21	79	756
757	72	310	16,500	90,000	229 17	74	18	82	757
758	11	200	1,950	6,000	177 27	89	32	68	758
759	40	310	8,185	70,000	204 62	66	12	88	759
760	8	310	10,700	150,000	1,337 50	4 31	7	93	760
761	196	120	52,444	295,000	267 57	2 23	14	86	761
762	103	150	17,300	100,000	167 96	1 12	17	83	762
763	88	365	54,000	1,163,000	613 64	1 68	5	95	763
764	18	24	3,300	16,000	183 33	7 64	21	79	764
765	145	306	129,421	322,862	892 56	2 92	40	60	765
766	13	312	8,496	89,938	653 54	2 09	10	90	766
767	17	310	15,822	50,000	930 71	3 00	32	68	767
768	161	310	137,440	1,980,000	853 71	2 75	7	93	768
769	59	100	7,330	42,500	124 22	1 24	17	83	769
770	77	150	6,100	30,000	79 22	52	20	80	770
771	77	90	8,650	45,000	112 34	1 25	19	81	771
772	191	107	27,572	134,814	144 36	1 35	21	79	772
773	67	103	10,777	43,294	160 84	1 56	25	75	773
774	83	120	11,405	86,000	125 36	1 05	13	87	774

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

CANNING, PORK PACKING, BACON CURING, ABATTOIRS.—TABLE NO. 24—*Continued.*

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
775	108	200	16,900	117,709	156 48	73	15	85	775
776	202	180	31,956	162,244	158 20	88	20	80	776
777	444	300	148,053	1,371,203	333 45	1 11	11	89	777
778	142	120	9,045	82,744	63 70	53	11	89	778
779	113	160	18,989	109,158	168 41	1 05	17	83	779
780	142	310	87,947	2,872,132	619 33	2 00	3	97	780
781	10	10	350	3,000	35 00	3 50	12	88	781
783	65	60	5,000	15,000	79 92	1 28	33	67	783
	4,110	Average 191	1,342,972	22,061,656	Average 332 95	Average 1 73	Average 18	Average 82	

DAIRY PRODUCTS AND OTHER FOODS.—TABLE NO. 25.

784	5	310	2,346	50,000	469 20	1 51	5	95	784
785	5	310	800	44,704	160 00	55	2	98	785
786	28	310	14,400	161,000	514 29	1 61	9	91	786
787	1	310	780	22,000	780 00	2 52	4	96	787
789	10	150	5,200	16,830	520 00	3 47	32	68	789
790	38	310	14,433	150,000	379 82	1 28	10	90	790
791	11	300	5,294	36,234	481 27	1 60	15	85	791
792	6	310	2,123	58,073	353 83	1 14	4	96	792
793	62	305	46,000	250,000	741 93	2 43	18	82	793
794	7	313	2,458	20,000	351 14	1 12	12	88	794
795	240	300	109,374	979,490	455 73	1 19	11	89	795
796	34	300	18,409	195,000	541 44	1 81	9	91	796
797	5	80	1,515	3,000	303 00	3 78	50	50	797
798	4	200	1,100	14,769	275 00	1 33	8	92	798
799	13	150	3,858	6,160	296 77	1 98	64	46	799
800	198	310	116,055	1,252,601	586 24	1 89	9	91	800
801	11	280	7,752	50,000	704 52	2 52	15	85	801
803	13	310	7,934	53,559	610 31	1 97	15	85	803
	691	Average 270	359,831	3,443,420	Average 473 58	Average 1 87	Average 16	Average 84	

BREWERIES, DISTILLERIES AND WINE FACTORIES, CIGAR AND TOBACCO FACTORIES.—TABLE NO. 26.

804	213	313	81,800	110,000	384 31	1 23	74	26	804
805	20	311	12,882	58,203	644 10	2 07	22	78	805
806	18	309	15,005	150,000	833 61	2 70	10	90	806
807	15	310	6,552	39,805	433 41	1 40	17	83	807
808	15	312	9,000	75,000	600 00	1 92	12	88	808
809	9	130	1,060	6,000	117 77	91	18	82	809
810	8	150	990	20,000	123 75	82	5	95	810
811	69	310	20,500	275,000	297 10	96	7	93	811
812	4	300	1,800	4,500	450 00	1 50	45	55	812
813	6	313	3,993	25,597	665 50	2 13	16	84	813
814	4	300	3,048	13,000	762 00	2 37	23	77	814
815	1	300	500	1,000	500 00	1 67	5	95	815
816	39	300	18,800	181,000	482 50	1 61	10	90	816
817	8	300	5,000	30,000	625 00	2 80	11	89	817

TABLES SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

BREWERIES, DISTILLERIES AND WINE FACTORIES, CIGAR AND TOBACCO FACTORIES.—TABLE NO. 26.—*Continued.*

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
818	6	310	3,540	10,000	590 00	1 90	35	65	818
819	13	313	8,771	26,880	680 70	2 17	34	66	819
820	35	310	22,500	60,000	642 86	2 07	37	63	820
821	245	312	162,656	663,000	659 82	2 11	25	75	821
822	124	300	79,700	216,000	642 75	2 14	37	63	822
823	234	295	117,536	1,416,684	502 29	1 70	8	92	823
824	393	300	237,497	651,099	604 83	2 02	36	64	824
825	99	306	106,250	373,314	1,073 23	3 51	28	72	825
826	13	310	8,350	60,000	642 31	2 07	14	86	826
827	108	300	89,760	315,000	831 11	2 77	29	71	827
828	26	312	24,985	100,000	960 96	3 08	25	75	828
829	38	313	31,263	163,289	822 71	2 63	19	81	829
830	65	310	46,300	171,480	620 00	2 00	27	73	830
831	7	300	6,121	70,000	865 85	2 89	9	91	831
832	162	280	79,585	85,322	491 27	1 76	93	7	832
	1,997	Average 294	1,205,744	5,376,173	Average 605 08	Average 2 03	Average 25	Average 75	

CHEMICAL WORKS, MEDICINE AND PERFUMERS.—TABLE NO. 27.

833	42	300	23,040	150,000	548 57	1 83	16	84	833
834	64	280	31,150	275,000	471 90	1 68	11	89	834
835	64	365	37,068	80,000	579 19	1 59	46	54	835
836	25	175	9,520	62,193	380 80	2 11	15	85	836
837	10	310	3,277	35,000	327 70	1 08	9	91	837
838	236	300	123,116	568,132	521 68	1 74	22	78	838
839	34	300	19,400	100,000	570 58	1 90	19	81	839
840	9	310	8,500	15,000	944 44	3 05	56	44	840
841	9	310	6,930	61,000	770 00	2 16	11	89	841
842	6	310	4,950	14,319	1,155 00	3 40	49	51	842
843	43	300	32,920	56,118	765 58	2 55	59	41	843
844	10	105	3,120	10,000	312 00	2 97	31	69	844
845	7	310	3,636	50,000	519 42	1 68	7	93	845
846	540	365	120,807	900,000	223 72	61	13	87	846
847	1	160	325	3,255	325 00	2 03	10	90	847
848	9	300	7,500	38,000	833 33	2 78	20	80	848
849	127	300	53,082	413,019	417 91	1 39	13	87	849
850	59	300	8,363	10,186	141 75	47	83	17	850
851	13	283	7,077	26,230	544 39	1 93	27	73	851
	1,305	Average 283	503,781	2,567,452	Average 544 89	Average 1 94	Average 27	Average 73	

OIL, REFINERIES, PAINTS AND VARNISH FACTORIES.—TABLE NO. 28.

853	6	306	3,000	18,000	500 00	1 67	17	83	853
854	9	300	10,340	50,000	1,148 88	3 63	21	79	854
855	4	300	2,750	24,000	687 50	2 29	11	89	855
856	144	300	70,060	235,000	486 11	1 62	30	70	856
857	27	300	23,511	150,123	870 78	2 90	16	84	857
858	11	313	8,823	69,058	802 91	2 57	13	87	858

TABLES SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

OIL, REFINERIES, PAINTS AND VARNISH FACTORIES—TABLE NO. 28.—*Continued.*

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
859	29	308	17,360	120,000	598 62	1 94	14	86	859
861	3	307	1,690	32,364	563 33	1 51	5	95	861
862	13	313	9,955	52,000	765 77	2 13	19	81	862
863	42	310	33,519	254,000	798 70	2 58	13	87	863
864	8	310	6,950	50,000	868 50	2 80	14	86	864
865	4	290	2,200	15,000	550 00	1 90	15	85	865
866	97	310	67,704	280,000	697 98	2 23	24	76	866
867	23	300	20,600	300,000	895 65	2 99	7	93	867
	420	Average 305	278,402	1,649,545	Average 731 05	Average 2 34	Average 16	Average 84	

GAS WORKS, ELECTRIC LIGHT, HEATING AND POWER WORKS.—TABLE NO. 29.

868	22	365	11,456	78,000	520 73	1 43	15	85	868
869	9	365	7,017	36,475	779 66	2 14	19	81	869
870	31	365	13,036	147,210	420 52	1 15	9	91	870
871	3	300	1,682	30,000	560 66	1 87	6	94	871
872	3	365	1,100	6,450	366 66	1 01	18	82	872
874	9	90	1,283	4,900	142 55	1 58	32	68	874
875	4	351	1,500	4,500	375 00	1 07	37	63	875
876	4	365	2,400	8,000	600 00	1 64	30	70	876
877	2	365	1,179	5,168	589 50	1 61	28	72	877
878	5	300	4,000	10,000	800 00	2 67	40	60	878
879	32	365	20,600	200,000	643 75	1 76	10	90	879
880	1,470	365	963,651	2,294,308	655 55	1 80	42	58	880
881	3	365	2,500	7,500	833 33	2 28	36	64	881
882	6	365	4,246	17,727	707 66	1 94	25	75	882
884	11	365	3,784	7,998	344 00	94	54	46	884
885	3	365	2,200	13,000	733 33	2 01	17	83	885
886	19	301	5,845	19,700	307 63	1 02	31	69	886
887	6	365	3,956	26,500	659 33	1 81	15	85	887
888	10	365	6,260	18,500	626 00	1 72	35	65	888
559	6	310	1,800	3,600	300 00	1 00	50	50	889
890	5	365	2,571	12,326	514 20	1 41	21	79	890
892	50	365	44,000	191,452	880 00	2 41	23	77	892
	1,713	Average 332	1,106,066	3,143,314	Average 561 82	Average 1 65	Average 27	Average 73	

PRINTING AND ALLIED TRADES.—TABLE NO. 30.

893	9	312	4,255	6,314	471 66	1 51	70	30	893
894	132	300	82,733	311,226	626 76	2 09	27	73	894
895	154	310	117,000	200,000	759 74	2 41	58	42	895
896	4	308	2,600	4,020	650 00	2 11	65	35	896
897	8	310	1,512	2,800	189 00	61	75	25	897
898	60	340	39,526	110,000	658 77	1 94	36	64	898

TABLES SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

PRINTING AND ALLIED TRADES.—TABLE NO. 30.—*Continued.*

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
899	21	310	11,319	18,500	539 00	1 74	63	37	899
901	50	310	35,200	125,000	704 00	2 27	28	72	901
902	68	310	36,401	79,569	535 31	1 73	46	54	902
903	10	300	11,421	12,000	1,142 10	3 81	95	5	903
904	43	300	25,880	60,000	601 86	2 61	43	57	904
905	3	310	1,088	10,016	362 66	1 17	11	89	905
906	9	310	5,576	6,200	619 55	2 00	93	7	906
907	19	310	10,900	26,000	573 63	1 85	42	58	907
908	265	310	56,175	92,501	211 98	69	61	39	908
909	29	304	25,176	41,112	868 14	2 86	61	39	909
910	191	306	110,000	325,000	575 92	1 88	34	66	910
911	116	300	55,000	200,000	474 14	1 58	28	72	911
912	39	310	22,000	59,000	564 10	1 63	37	63	912
913	14	300	8,593	26,000	613 79	2 05	33	67	913
914	8	275	4,650	12,000	581 25	2 11	38	62	914
915	6	300	1,050	5,088	175 00	58	21	79	915
	1,258	Average 302	668,055	1,732,346	Average 568 11	Average 1 87	Average 48	Average 52	

BRICK, TILE AND PORTLAND CEMENT WORKS.—TABLE NO 31.

916	71	100	27,375	53,000	385 56	3 86	57	43	916
917	60	60	11,128	30,000	185 47	3 09	37	63	917
918	36	200	11,454	23,364	318 11	1 59	50	50	918
919	25	125	7,858	14,250	314 32	2 51	56	44	919
920	69	300	61,650	91,602	806 52	2 69	67	33	920
921	24	156	11,200	37,000	466 66	2 99	30	70	921
922	45	230	36,170	89,837	803 78	3 49	41	59	922
923	9	310	5,000	15,000	555 55	1 79	33	68	923
924	52	200	11,606	23,100	223 71	1 12	50	50	924
925	5	100	800	2,600	160 00	1 60	40	60	925
926	21	200	6,149	19,000	292 81	1 41	32	68	926
927	72	306	62,748	113,000	871 50	2 85	55	45	927
928	24	280	14,025	56,921	584 38	2 09	25	75	928
930	53	300	25,000	50,000	757 57	2 52	50	50	930
931	132	220	48,000	300,000	364 39	1 66	16	84	931
933	42	225	25,319	67,881	602 83	2 67	38	62	933
934	3	310	1,800	6,000	600 00	1 94	30	70	934
935	2,689	365	2,602,341	5,844,845	967 78	3 28	45	55	935
936	12	300	8,000	20,000	666 67	2 22	40	60	936
937	79	275	62,500	190,000	778 44	2 83	33	67	937
938	13	301	8,598	16,279	661 38	2 20	53	47	938
939	56	170	18,600	48,150	332 14	1 95	39	71	939
940	21	313	15,865	71,021	755 48	2 09	24	76	940
941	86	300	52,125	91,000	606 10	2 02	57	43	941
942	8	300	3,000	6,200	375 00	1 25	50	50	942
	3,687	Average 238	3,138,311	7,280,050	Average 537 45	Average 2 31	Average 42	Average 58	

TABLES SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Concluded.*

MISCELLANEOUS INDUSTRIES—TABLE No. 32.

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
943	48	323	35,988	94,028	749 75	2 32	38	62	943
944	22	300	8,804	29,000	400 18	1 33	30	70	944
945	42	300	11,060	100,000	263 33	88	11	89	945
946	65	313	38,000	170,000	584 62	1 87	22	78	946
948	10	312	7,000	25,000	700 00	2 24	24	76	948
949	30	300	22,476	41,109	749 20	2 50	55	45	949
950	34	365	23,731	106,650	697 97	1 91	22	78	950
	251	Average 316	147,059	565,787	Average 592 15	Average 1 87	Average 29	Average 71	

SUMMARY OF 32 TABLES.

67,106	Average 284	33,681,997	175,657,467	Average 530 01	Average 1 92	Average 28	Average 72

AMERICAN FEDERATION OF LABOUR

Mr. Frank Morrison, Secretary of the American Federation of Labour, in his thirty-fourth report, presented at the annual convention of that body, held at Philadelphia, Pa., gives statistics for the past year. These figures are of interest to wage earners and others of Ontario, as showing the movements, changes of wages, hours of labour, benefits distributed, etc., by the International Trades and Labour Unions of the United States and Canada.

Mr. Morrison says:

Charters.—Reports from the Secretaries of 92 of our National and International organizations furnish us with the information that 2,578 charters have been issued during the past year and 1,351 surrendered—1,287 of the charters surrendered were locals of the National and International Unions, and 64 affiliated direct with the American Federation of Labour.

Gain in Membership.—The gain in membership reported by the Secretaries of 48 International organizations over the membership on the first of September last year is 62,882.

Strikes.—Reports from 70 National and International organizations and from local unions directly affiliated with the American Federation of Labour show that there were 957 strikes, in which there were 131,324 involved. Of that number 74,350 secured improved conditions. The total cost of the strikes reported on was $4,280,305.68. Adding to that amount $109,204.46, donations made by unions for financial assistance of other unions, we have a total of $4,389,510.14 expended to sustain members on strike during the past year.

The following tables are from Mr. Morrison's report:

CHARTERS, GAIN IN MEMBERSHIP, AND STRIKES.

Organizations.	Charters issued.	Charters surrendered.	Gain in membership.	Strikes won.	Strikes compromised.	Strikes pending.	Strikes lost.	Number involved.	Number benefited.	Gain in wages.	Reduction in hours per day.	Cost of strikes.	Donations to other unions.
												$ c.	$ c.
A. F. of L. Locals	178	64	.....	13	5	7	3	2,704	1,733	.....	.....	17,092 20	5,000 51
Bakers	37	13	2,000	5	....	2	2	253	192	$1 per week	1 hour	7,050 00	.....
Barbers	39	19	1,259	5	....	1	....	439	71	.....	.....	3,373 00	.....
Bill Posters	4	3	.....	....	....	1	1	20	.....	.....	.....	1,200 00	300 00
Blacksmiths	25	6	.....	....	....	3	....	4,000	.....	.....	.....	35,000 00	.....
Boilermakers	21	24	.....	6	....	....	2	3,500	.....	.....	.....	76,270 67	965 18
Bookbinders	7	1	.....	....	....	....	....	.....	.....	.....	.....	.....	.....
Boot and Shoe Workers	25	14	2,428	3	....	....	....	107	.....	.....	.....	4,273 24	15,000 00
Brewery Workers	24	36	.....	18	4	6	1	2,321	2,262	27c per hour *a*	5/6 hr. pr dy *b*	8,218 00	3,648 00
Brick, Tile & Terra Cotta Workers	10	4	.....	5	....	....	1	.....	.....	.....	.....	.....	.....
Bridge & Structural Iron Workers	19	8	1,000	....	....	....	....	.....	.....	47½c a day †	.....	.....	2,000 00
Broommakers	12	2	100	6	....	1	1	240	220	*c*	.....	2,400 00	500 00
Brushmakers	1	.....	60	....	....	....	....	.....	.....	.....	.....	.....	50 00
*Carpenters, Brotherhood	274	179	.....	12	2	11	....	2,568	6,827	5c per hour	1 hr. per day	54,164 00	10,902 75
Carriage and Wagon Workers	4	1	1,128	1	....	....	....	278	277	.....	.....	2,500 00	.....
Carvers, Wood	.....	.....	.....	13	....	1	1	150	150	25c to 50c	.....	712 68	.....
Cement Workers	22	15	.....	....	....	....	....	.....	.....	.....	.....	.....	150 00
Cigarmakers	8	8	.....	21	4	20	4	3,976	2,869	.....	.....	.....	.....
Clerks, Retail	.....	.....	.....	1	....	....	....	.....	.....	.....	.....	.....	.....
Cloth Hat and Cap Makers	2	1	45	22	....	1	7	650	575	.....	.....	20,500 00	2,000 00
Commercial Telegraphers	2	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....
Compressed Air Workers	.....	.....	260	....	....	....	....	.....	.....	.....	.....	.....	265 00
Coopers	14	1	.....	1	2	4	5	416	.....	*d*	.....	13,581 65	.....
Cutting Die and Cutter Makers	1	2	.....	2	....	....	....	29	29	.....	.....	250 00	.....
Diamond Workers	.....	.....	.....	....	1	....	....	300	.....	.....	.....	.....	300 00
Electrical Workers	140	49	8,394	28	5	6	1	4,600	4,150	30c a day	.....	.....	.....
Elevator Constructors	1	.....	63	1	....	....	....	28	28	*e*	6 hrs. per wk	.....	.....
Engineers, Steam	34	8	2,000	4	....	13	1	92	19	.....	.....	4,790 50	.....
Firemen, Stationary	22	1	500	5	1	1*f*	....	218	196	15%	*g*	3,140 20	8,000 00
Foundry Employees	2	1	.....	1	1	....	....	320	245	18%	.....	980 00	65 00
Freight Handlers, Railroad	11	5	.....	....	....	....	....	.....	.....	.....	.....	.....	.....
Garment Workers, United	73	49	.....	....	....	....	....	.....	.....	.....	.....	.....	.....
Garment Workers, Ladies	7	1	.....	....	....	....	....	.....	.....	*h*	*h*	.....	.....
Glass Bottle Blowers	9	6	.....	....	....	....	....	.....	.....	.....	.....	.....	525 00
Glass Workers, Amal	2	2	.....	....	....	2	....	15	.....	2½ c per hour *i*	.....	.....	.....

Glass Workers, Flint	19	5	.....	2	....	3	....	285	285	.....	.....	65,499 05	300 00
Glove Workers	6	4	.....	....	....	2	....	1,420	.....	.....	.....	.....	.....
Granite Cutters	8	2	.....	11	1	....	....	.....	2,800	.....	.....	2,717 60	.....
Grinders, Pocket Knife Blade	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	17 50
Hatters	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	6,748 10
Hodcarriers	80	56	3,722	27	5	....	....	3,200	4,000	2½c to 5c a day	.....	.....	500 00
Horseshoers	17	10	200	2	....	3	....	225	175	.....	.....	2,000 00	.....
Hotel & Restaurant Employees	97	65	3,792	71	19	14	5	1,931	2,251	.....	.....	42,009 01	22,783 78
Iron and Steel Workers	9	4	500	2	....	....	....	400	600	.....	.....	30,000 00	600 00
Lace Operatives	2	.....	176	9	....	....	....	65	65	.....	.....	550 00	466 00
Lathers	21	17	.....	....	....	....	....	.....	.....	12½c to 25c a day	.....	.....	.....
Laundry Workers	26	7	800	4	2	1	2	322	267	50c a day	*j*	400 00	1,000 72
Leather Workers on Horse Goods	8	3	.....	....	....	3	3	28	.....	.....	.....	3,191 00	1,500 00
Lithographers	3	.....	259	....	....	....	....	.....	.....	.....	*k*	.....	.....
Longshoremen	37	18	3,000	34	12	1	3	1,700	1,400	.....	.....	5,484 00	400 00
Machine Printers & Color Mixers	.....	.....	4	....	....	3	....	40	.....	.....	.....	.....	.....
Machinists	86	40	4,338	6	1	18	....	1,407	600	25c per day *o*	*p*	195,265 00	1,000 00
Maintenance of Way Employees	38	30	.....	....	....	....	....	.....	.....	.....	.....	.....	.....
Marble Workers	5	1	800	1	....	1	....	1,000	.....	.....	.....	15,000 00	.....
Meat Cutters and Butcher Workmen	27	14	520	7	4	3	....	900	750	20c & 45c a day	1 & 2 hrs. *l*	400 00	3,000 00
Metal Polishers	15	10	500	22	9	12	3	400	400	25c *m*	.....	26,755 00	1,500 00
Metal Workers, Sheet	32	15	400	6	....	6	1	500	300	25c per day	.....	.....	2,000 00
Mine Workers, United	208	146	.....	2	1	2	....	59,000	28,000	.....	.....	2,965,702 50	200 00
Miners, Western Federation of	7	26	.....	....	....	....	....	.....	.....	.....	.....	.....	.....
Moulders	3	16	.....	....	....	9	....	541	.....	.....	.....	234,618 62	.....
Musicians	45	9	1,500	....	....	....	....	.....	.....	.....	.....	.....	1,000 00
Painters	124	96	585	....	....	....	....	.....	.....	.....	.....	.....	.....
Papermakers	10	6	.....	....	....	....	....	.....	.....	.....	.....	.....	.....
Patternmakers	.....	.....	.....	8	....	11	....	210	171	.....	.....	6,447 72	275 00
Paving Cutters	7	6	.....	7	3	2	....	.....	600	5 to 15%	1 hour *n*	4,657 00	150 00
Photo-Engravers	2	1	300	4	....	4	....	.....	.....	.....	.....	19,703 38	.....
Piano and Organ Workers	.....	2	.....	....	....	1	....	50	.....	.....	.....	1,000 00	150 00
Plasterers	24	18	900	....	....	....	....	.....	.....	.....	.....	.....	.....
Plumbers	62	12	3,000	38	4	15	....	4,540	.....	.....	.....	44,776 00	.....
Post-office Clerks	19	.....	600	....	....	....	....	.....	.....	.....	.....	.....	500 00
Potters	2	1	1,238	....	....	1	....	24	.....	.....	.....	5,257 50	174 92
Powder and High Explosive Workers	.....	1	.....	....	....	....	....	.....	.....	.....	.....	.....	102 00
Print Cutters	.....	.....	.....	....	....	3	....	12	.....	.....	.....	.....	.....
Printing Pressmen	23	7	1,600	4	2	....	....	400	200	25c per day	.....	120,000 00	125 00
Pulp and Sulphite Workers	32	2	.....	....	....	3	....	200	.....	*z*	.....	.....	1,200 00
Quarry Workers	6	2	400	3	1	2	....	580	500	*q*	1 hour *r*	2,270 00	.....
Railroad Signalmen	1	1	.....	....	....	....	....	.....	.....	.....	.....	.....	.....
Railway Postal Clerks	7	.....	416	....	....	....	....	.....	.....	.....	.....	.....	.....
Railroad Telegraphers	5	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....
Railway Carmen	90	33	2,247	....	....	4	....	10,000	.....	.....	.....	9,780 65	980 60

CHARTERS, GAIN IN MEMBERSHIP AND STRIKES—*Continued.*

Organizations.	Charters issued.	Charters surrendered.	Gain in membership.	Strikes won.	Strikes compromised.	Strikes pending.	Strikes lost.	Number involved.	Number benefited.	Gain in wages.	Reduction in hours per day.	Cost of strikes.	Donations to other unions.
												$ c.	$ c.
Railway Employees, Street	28	4	3,000	12	2	2	4	2,294	1,965	*f*		25,860 30	1,705 00
Roofers, Composition	9	5	80	1	....	....	....	30	30	25c per day		125 00	150 00
Seamen	7	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	3,385 00
Slate and Tile Roofers	3	1	.....	3	1	....	....	180	.....	*s*	.....	.....	.....
Slate Workers	1	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....
Spinners	2	.....	.....	3	....	1	....	225	125	.....	.....	20,000 00	.....
Stage Employees, Theatrical	43	.....	700	6	....	6	....	100	100	10%	.....	2,000 00	1,000 00
Stereotypers and Electrotypers	6	1	165	2	....	....	....	24	6	.....	.....	6,722 04	.....
Stonecutters	4	2	600	3	2	....	1	325	260	50c a day	4 hrs. per wk	4,250 00	.....
Stove Mounters	3	†2	50	....	....	....	....	.....	.....	.....	.....	.....	325 00
Switchmen	5	3	.....	....	....	....	....	.....	.....	.....	.....	.....	400 00
Tailors	25	11	.....	6	1	3	....	.....	.....	.....	.....	12,026 85	.....
Teamsters	82	45	4,100	36	5	2	....	7,300	7,240	.....	.....	17,000 00	.....
Textile Workers	64	43	.....	2	2	2	....	1,500	.....	.....	.....	26,368 50	.....
Tile Layers	9	1	200	3	....	....	1	125	100	*u*	.....	1,500 00	1,000 00
Timber Workers	6	5	.....	9	1	3	3	1,785	580	.....	.....	4,175 00	2,000 00
Tobacco Workers	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	2,000 00
Travellers' Goods and Leather Novelty Workers	3	4	.....	1	3	....	1	355	105	$2 per week	½ & 1 hour	2,000 00	70 00
Tunnel and Subway Constructors	1	.....	.....	....	10	....	1	50	300	25c a day *x*	2 hours *y*	.....	700 00
**Typographical Union	27	11	2,938	3	1	5	2	107	32	.....	.....	82,684 82	.....
Upholsterers	6	4	.....	10	1	2	....	320	300	50c per day	.....	16,607 00	.....
Weavers, Elastic Goring	1	.....	15	....	....	....	....	.....	.....	.....	.....	.....	.....
Weavers, Wire	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	125 00
Totals	2,578	1,351	62,882	543	118	236	60	131,324	74,350	.....	.....	4,280,305 05	109,204 46

a for 1,697 members; *b* for 974 members; *c* $1.00 for 40 members, 25c. a day for 200; *d* 25 members secured $3.00 a week increase; *e* average gain of 32c. per day for mechanics and 27c. per day for helpers; *f* lockout 26 members involved; *g* 8 hours and 6 day working week instead of 12 hours and 7 day working week; *h* 1 agreement secured without strike involving 6,500, increasing wages 25% and 35% and reducing hours of labor 4 per week; *i* for 320 men through agreement secured without strike; *j* 1 agreement reduced hours from 11 to 9 per day, 5 agreements reduced hours from 10 to 9 per day, benefiting 33 members; *k* hours of labor reduced 6 per week for 52 members; *l* 2,100 received ½ day holiday for 4 months of year; *m* for 350; *n* for 300 members; *o* for 61,000; *p* 30,000 men secured reductions in working hours; *q* 2½c. per hour to 50c. per day, 1,280 members; *r* for 300; *s* advances in wages for 300 members through 5 agreements secured without strike; *t* from 1c. to 5½c. per hour, 200 benefited; *u* 40c. per day for tile layers, 25c. per day for helpers; *x* 25c. a day for 75 members, 50c. a day for 350; *y* for 30; *z* 5 agreements secured without strikes, resulting in 7½% increase for 700 members, 8% for 600, 5% for 600, 3½% for 500. † for 5,604 members.

* from July 1, 1913, to June 30, 1914. ** from June 1, 1913, to May, 31, 1914.

BENEFITS PAID TO MEMBERS BY INTERNATIONAL ORGANIZATIONS DURING THE PAST YEAR.

Organizations.	Death benefits	Death benefits members' wives.	Sick benefits.	Travelling benefits.	Tool insurance.	Unemployed benefits.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
A. F. of L. Locals	5,746 50	.....	6,945 42	.....	.....	.....
Bakers	5,466 50	925 00	43,021 00	.....	.....	.....
Barbers	34,650 00	.....	51,122 20	.....	.....	.....
Boilermakers	5,500 00	.....	.....	.....	.....	.....
Boot and Shoe Workers	15,400 00	.....	88,138 13c	.....	.....	.....
Brick, Tile & Terra Cotta Workers	200 00	.....	.....	.....	.....	.....
Bridge and Structural Iron Workers	11,700 00	.....	.....	.....	.....	.....
Broommakers	100 00	.....	.....	.....	.....	.....
Carpenters	255,587 68	41,950 00	.....	.....	.....	.....
Carriage & Wagon Workers	1,450 00	.....	.....	.....	.....	.....
Carvers, Wood	3,450 00	.....	.....	.....	.....	.....
Cigarmakers	280,000 00a	.....	196,000 00	45,000 00	45 00	31,000 00
Clerks, Retail	9,075 00	.....	16,750 00	.....	.....	.....
Cloth Hat and Cap Workers	.....	.....	3,998 00	.....	.....	.....
Commercial Telegraphers	300 00	.....	.....	.....	.....	.....
Compressed Air Workers	900 00	.....	.....	.....	.....	.....
Coopers	4,850 00	.....	.....	.....	32 60	.....
Cutting Die and Cutter Makers	800 00	.....	1,000 00	.....	.....	.....
Diamond Workers	750 00	150 00	1,768 00	.....	.....	12,678 75
Electrical Workers	19,900 00	.....	.....	.....	.....	.....
Firemen, Stationary	10,000 00	.....	6,400 00	.....	.....	.....
Foundry Employees	250 00	.....	827 00	.....	.....	9,890 13
Glass Bottle Blowers	52,450 35	.....	.....	.....	.....	.....
Glass Workers, Amalg'm'd	800 00	.....	.....	.....	.....	.....
Granite Cutters	29,139 00	.....	.....	.....	.....	.....
Grinders, Pocket Knife Blade	.....	.....	163 00	.....	.....	.....
Hatters	57,500 00	.....	.....	.....	.....	.....
Hodcarriers	5,100 00	.....	.....	.....	.....	.....
Hotel and Rest. Emp.	67,205 40	.....	74,423 32	.....	.....	.....
Iron and Steel Workers	5,700 00	1,400 00	14,555 00	.....	.....	.....
Lace Operatives	2,077 50	300 00	.....	.....	.....	.....
Lathers	6,530 70	.....	.....	.....	.....	.....
Laundry Workers	600 00	.....	.....	.....	.....	.....
Leather Workers on H. G.	1,255 00	.....	2,245 00	.....	.....	.....
Lithographers	10,450 00	.....	.....	.....	.....	.....
Machine Printers and Color Mixers	2,000 00	.....	.....	.....	.....	2,500 00
Machinists	60,492 00	.....	.....	.....	.....	.....
Meat Cutters and But. Wk.	2,950 00	.....	.....	.....	.....	.....
Metal Polishers	5,000 00	.....	7,000 00	.....	.....	1,100 00
Metal Workers, Sheet	11,400 00	.....	.....	.....	.....	.....
Miners, Western Fed.	31,353 25	.....	121,028 19	.....	.....	.....
Moulders	77,440 00	.....	179,791 00	.....	.....	23,530 00
Painters	109,527 50	11,750 00	22,000 00b	.....	.....	.....
Patternmakers	4,500 00	.....	8,895 55	.....	3,200 47	16,000 00
Paving Cutters	2,625 00	.....	.....	.....	.....	.....
Photo-Engravers	2,300 00	.....	8,896 24	.....	.....	.....
Piano and Organ Workers	1,600 00	400 00	1,457 65	.....	.....	2,000 00
Plasterers	40,000 00	.....	.....	.....	.....	.....
Plumbers	21,700 00	.....	71,314 00	.....	.....	.....
Post Office Clerks	1,800 00	.....	3,680 00	.....	.....	.....
Potters	5,450 00	.....	.....	.....	.....	.....
Print Cutters	1,400 00	.....	.....	.....	.....	.....
Printing Pressmen	18,675 00	.....	.....	.....	.....	.....

BENEFITS PAID TO MEMBERS BY INTERNATIONAL ORGANIZATIONS DURING THE PAST YEAR.—*Concluded.*

Organizations.—*Concluded*	Death benefits.	Death benefits members' wives.	Sick benefits.	Travelling benefits.	Tool insurance.	Unemployed benefits.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Pulp and Sulphite Workers	.....	.....	1,000 00	.....	.....	250 60
Quarry Workers	670 25	.....	.....	.....	.....	.....
Railroad Telegraphers	108,100 00	.....	.....	.....	.....	.....
Railway Employees, Street	231,334 50	.....	59,692 85	.....	.....	.....
Roofers, Composition	1,500 00	.....	.....	.....	.....	.....
Sawsmiths	.....	.....	310 00	.....	.....	.....
Seamen	14,408 98*d*	.....	.....	8,604 90*e*	.....	.....
Slate and Tile Roofers	2,300 00	.....	.....	.....	.....	.....
Slate Workers	700 00	100 00	.....	.....	.....	.....
Stereotypers & Electrot'rs	5,300 00	.....	.....	.....	.....	.....
Stonecutters	9,675 00	.....	.....	.....	.....	.....
Stove Mounters	1,200 00	.....	.....	.....	.....	.....
Switchmen	202,716 80	.....	.....	.....	.....	.....
Tailors	11,505 15	.....	22,110 58	.....	.....	.....
Textile Workers	2,600 00	.....	.....	.....	.....	.....
Tobacco Workers	1,100 00	.....	6,038 00	.....	.....	.....
Travellers' Goods & Lea. Novelty Workers	400 00	.....	.....	.....	.....	.....
Tunnel and Subway Con.	2,800 00	.....	.....	800 00	.....	.....
*Typographical Union	255,534 21	.....	.....	.....	.....	.....
Weavers, Elastic Goring	300 00	.....	.....	.....	.....	76 00
Weavers, Wire	.....	300 00	528 00	.....	.....	.....
Totals	2,157,241 27	57,275 00	1,031,098 13	54,404 90	3,278 07	99,024 88

a, includes death benefits members' wives; *b*, total disability only; *c*, includes $3,300 disability benefits; *d*, includes hospital benefits; *e*, shipwreck benefits.

*Old-age pension, $264,795.

AVERAGE PAID UP MEMBERSHIP.

Year.	Membership.
1897	264,825
1898	278,016
1899	349,422
1900	548,321
1901	787,537
1902	1,024,399
1903	1,465,800
1904	1,676,200
1905	1,494,300
1906	1,454,200
1907	1,538,970
1908	1,586,885
1909	1,482,872
1910	1,562,112
1911	1,761,835
1912	1,770,145
1913	1,996,004
1914	2,020,671

CHANGES OF WAGES AND HOURS

Barbers, at Hamilton, received an increase of $1 per week.

Brass workers (15), at Hamilton, received a 5 per cent. increase.

Brewery workers, at Hamilton, received an advance of $2 per week.

Brewery workers, at Berlin and Waterloo, received an increase of 50c. per week.

Brewery workers (26), at Ottawa, had their working hours reduced from 54 to 48 per week.

Civic labourers, at Guelph, received an advance of 2½ cents per hour.

Civic labourers, at Hamilton, received increases.

Civic labourers (3,000), at Toronto, had their wages increased to $15 a week.

Civic labourers (unskilled), at Niagara Falls, had their rate of wages fixed at 20 cents per hour for eight hours per day.

Employees of the city waterworks, at London, received increases.

Employees of the Ottawa street railway received increases of from 1½ to 2 cents per hour.

Firemen, at Chatham, received increases.

Ford Motor Company employees, at Windsor, received a reduction of one hour per day from December 1st.

Hydro-Electric employees, at London, were granted increases.

Lumbermen (150), at Ottawa, had their working hours reduced from 54 to 48 per week.

Miners in the Cobalt camps received a reduction of working hours in accordance with the provisions of an Act passed during the last session of the Ontario Legislature.

Painters and decorators (16), at Guelph, received an increase of 2½ cents an hour.

Painters and paperhangers (30), at St. Thomas, received increases.

Plasterers, at Hamilton, received an increase of 2½ cents per hour.

Plasterers, at St. Catharines, received an increase of 2½ cents per hour from May 1st.

Plumbers, at Ottawa, received increases.

Police constables, at Chatham, received increases.

Police constables (86), at Hamilton, received increases.

Printers, at London, received an advance of $1 per week.

Printers, at Ottawa, received increases.

Street railway employees, at Berlin, received an advance of 1 cent per hour.

CO-OPERATIVE SOCIETIES

The growth of co-operative societies in Canada is making steady if not very rapid progress. The following statistics, etc., are taken from "The Canadian Co-operator," the organ of the Co-operative Union of Canada, published monthly at Brantford, Ontario:—

Societies in Affiliation.

Ontario.

The Guelph Co-operative Association, Limited, Guelph.
The Preston Co-operative Association, Limited, Preston.
The Civil Service Co-operative Supply Association, Ottawa.
The Twin City Co-operative Association, Limited, Berlin.
The Consumers' Co-operative Society, Limited, London.
The Brockville Co-operative Society, Limited, Brockville.
The Peterborough Co-operative Society, Limited, Peterborough.
The Galt Co-operative Society, Limited, Galt.
The Co-operative Trading Co., Limited, Port Arthur.

Quebec.

L'Avenir de Magog, Societe Co-operative, Magog.
The Industrial Co-operative Society of Valleyfield, Limited, Valleyfield.

Nova Scotia.

The British-Canadian Co-operative Society, Limited, Sydney Mines.
The Workmen's Store Co., Limited, Dominion.
The Inverness Co-operative Society, Limited, Inverness.
The Glace Bay Co-operative Society, Limited, Glace Bay.
The Workmen's Co-operative Society, Limited, Sydney.

British Columbia.

The New Westminster Co-operative Association, Ltd., New Westminster.
The Merritt and District Industrial Co-operative Society, Ltd., Merritt.
Workmen's Co-operative Association, Limited, Nanaimo.

Alberta.

The Western Canadian Co-operative Trading Co., Limited, Coleman.
The Eckville and Gilby Co-operative Society, Limited, Eckville.
The Hillcrest Co-operative Society, Limited, Hillcrest.
The North Lethbridge Co-operative Society, Limited, Lethbridge.

Manitoba.

The Winnipeg Co-operative Society, Limited, Winnipeg.

CANADIAN CO-OPERATIVE STATISTICS FOR 1912

Name of Society	Years Established	Number of Members	Share Capital	Loan Capital	Reserve Fund	Value of Stock in Trade	Other Assets	No. Employees at Dec. 31	Salaries and Wages Paid	Sales for the Year	Increase	Decrease	Rate of Interest Paid	Rate of P'ch'e Dividend paid	Net Profits	Total Purchase Dividend Paid	Lines of Merchandise Handled
GLACE BAY, N.S. Co-operative Society, Ltd.	7	750	$ 30,000.00 Total $41	$ 11,435.00 435.00	$ 5,436.33	$ 42,084.27	$ 52,035.81	35	$ 21,500.00	$ 286,000.00	$ 35,000.00	—	% 5	% 8	$ 26,000.00	$ 21,000.00	General lines of Merchandise
DOMINION, N.S. Workmen's Store Co., Ltd.	9¾	541	34,853.36	—	8,561.20	39,761.54	34,448.77	22	5,443.10	189,470.27	59,693.14	—	6	10	21,699.30	17,500.00	General lines of Merchandise
GUELPH, ONT. Co-operative Ass'n. Ltd.	8	585	4,770.00 Total $18	13,250.13 020.13	3,500.00	11,153.32	22,849.17	22	Dist'b've 8,284.35 Prod'tive 2,912.00	101,546.38	12,512.89	—	5	5	5,876.44	4,392.74	Groceries, Meats, Bakery, Boots, Crockery Coal
INVERNESS, N.S. Co-operative Society, Ltd.	6	210	8,831.00 Total 11	2,510.00 341.00	2,198.17	13,770.24	8,535.47	6	2,391.60	40,355.16	2,518.00	—	7	7	2,834.45	1,916.32	Groceries, Dry Goods, Boots and Shoes
VALLEYFIELD, P.Q. Industrial Co-op. Soc'y Ltd.	9½	139	4,961.45 Total	1,000.00 5,961.45	726.36	5,776.14	3,825.95	4	2,312.00	47,299.17	8,123.61	—	6	7	2,989.07	2,972.24	Groceries, Provisions, Boots and Shoes
OTTAWA, ONT. Civil Service Co-op. Supply Ass'n. Ltd.	1½	574	—	2,570.00	216.19	5,619.91	3,356.73	8	5,039.09	51,152.80	16,647.77	—	5	2	889.08	782.27	Groceries
PRESTON, ONT. Co-op. Association, Ltd.	4	280	1,356.00 Total	867.00 2,223.00	—	2,713.00	911.00	4	2,490.00	22,108.32	3,000.00	—	5	5¼	Not Supplied	930.00	Groceries
SYDNEY MINES, N.S. Co-op. Association, Ltd.	7	340	17,784.02 Total	7,727.37 25,511.39	3,875.00	25,273.13	12,490.15	20	8,901.21	146,398.23	32,217.45	..	5	10	15,758.97	7,696.26	Groceries, Provisions Dry Goods, Boots, etc. and Hardware
ECKVILLE and GILBY Co-operative Co., Ltd.	1½ mhs	80	1,800.90 Tota'	300.00 2,100.90	—	3,500.00	1,400.00	2	135.00 for 6w'ks	1,811.85 for 6 weeks	—	—	7	—	—	—	Groceries, Hardware, Boots and Shoes, Dry Goods and Produces
LONDON, ONT. Consumer's Co-operative Society, Ltd.	9 mhs	150	1,240.00	—	—	500.00	1,000.00	2	686.58 for 9 mhs	6,693.81 for 9 m'nths	—	—	—	—	—	—	Groceries and Provisions
BERLIN, ONT. Twin City Co-operative Society, Ltd.	9½ mhs	300	1,985.00 Total	334.50 2,319.50	—	2,553.90	911.99	3	not supplied	14,609.25 for 9½ m'h's	—	—	5	4	332.08 for 9½ mhs	—	Groceries
Western Canad'n Co-op. Trading Co., Ltd., Coleman, Alta.	6	100	6,966.32 Total	864.67 7,830.99	5,844.69	23,394.00	19,689.96	11	8,759.02	112,267.65	17,000.00	—	6	10	8,000.00	7,500.00	Groceries, Provisions, Dry Goods, Shoes and Men's Furnishings, House Furnishings
Hillcrest Co-operative Society Hill'crest, Alberta	1½	160	4,200.00 Total	45.00 4,245.00	281.77	7,096.11	1,931.97	5	4,843.50	43,790.81	—	—	5	5	1,911.24	925.00	Groceries, Dry Goods, Boots and Shoes
BROCKVILLE, ONT. Co-op. Society, Ltd.	6 mhs	145	1,300.00 Total	550.00 1,850.00	—	1,000.00	850.00	3	897.00	8,970.00	—	—	5	—	—	—	Groceries and Provisions
MERRITT, B.C. Industrial Co-op. Society	1¼	109	1,624.40 Total	1,800.00 3,424.40	—	2,702.92	2,100.00	3	2,874.00	30,854.48	—	—	5	—	679.49	—	Provisions only
The Workmen's Co-operative Society, Ltd. Sydney, N.S.	10 mhs	207	4,786.85	—	205.85	4,223.74	5,215.03	6	2,937.16	29,212.70	—	—	5	5&7	1,812.24	1,641.35	Groceries, Dry Goods, Boots and Shoes
NEW WESTMINSTER, B.C. Co-op. Association, Ltd.	5½	330	8,412.73	—	960.00	not given	1,106.07	5	6,143.85	56,524.01	—	—	5	—	—	—	Groceries
		5000	134,872.03	43,253.67	31,805.56	191,122.22	172,658.07	161	86,549.46	1,194,064.89	186,712.86				88,782.36	67,256.18	

THE GROWTH OF BUSINESS

As to the trade done, the following comparison will show a substantial advance each year:

TRADE DONE.

1909	$347,064 34
1910	569,311 16
1911	789,291 18
1912	1,194,064 89

In dividends paid on purchases—representing an actual reduction in the cost of living—progress equally satisfactory is to be recorded. The following figures thereof take no account of the proportion of net profits carried to reserve or other funds created, or disbursements made for social uses.

DIVIDENDS ON PURCHASES.

1909	$22,828 18
1910	28,235 08
1911	47,338 65
1912	67,256 18

The share capital employed in the movement has also shown each year a substantial increase. Apart from the under-mentioned figures, in 1912, the societies had members loan capital aggregating $43,253.67, making a total investment by members of $178,125.70. The share capital alone for the years under review was as follows:

SHARE CAPITAL.

1909	$27,836 32
1910	53,416 66
1911	105,316 66
1912	134,872 03

The membership of co-operative societies also steadily and substantially advances each year as will be seen from the following figures:

MEMBERS.

1909	1,595
1910	2,605
1911	3,788
1912	5,006

THE LAWS RELATING TO LABOUR—CHRONOLOGY OF ONTARIO LABOUR LAWS.

Apprentices' and Minors' Act. Passed, 1871. Amended, 1874. Cap. 161, R.S.O. 1897, 1911.

Mechanics' and Wage-earners' Liens. Passed, 1873. Amended, 1874, 1878, 1882, 1884, 1887, 1890, 1896, 1897. Cap. 153, R.S.O., 1897, 1901, 1902, 1904. Consolidated and amended, 1910. Previous Act repealed.

Master and Servant Act. Passed, 1873. Amended, 1886. Cap. 157, R.S.O. 1897, 1901, 1904, 1908. Consolidated and amended 1910. Previous Act repealed.

Immigration Aid Societies Act. Passed, 1873. Cap. 212, R.S.O., 1897, 1904, repealed 1905.

Act to Facilitate and Adjustment of Disputes between Masters and Workmen. Passed, 1873. Cap. 159, R.S.O., 1897.

Act Respecting Innkeepers. Passed, 1874. Amended, 1882. Cap. 187, R.S.O., 1897, 1904, 1907.

Act Respecting Public Meetings, Cap. 230, R.S.O., 1897.

Act Respecting Threshing Machines. Passed, 1874. Cap. 265, R.S.O., 1897.

Act Respecting Co-operative Associations. Passed, 1880. Amended, 1884. Cap. 202, R.S.O., 1897, 1904, 1905, repealed 1907 (see Companies' Act).

Act Respecting Safety of Railway Employees. Passed, 1881. Cap. 207, R.S.O., 1897.

Act Respecting Accidents to Employees on Railways. Passed, 1881. Cap. 266, R.S.O., 1897.

Bureau of Industries. Established, 1882.

Act Respecting Pawnbrokers. Passed, 1884. Cap. 188, R.S.O., 1897, 1907. Consolidated, 1911. Old Act repealed.

Factories Act. Passed, 1884. Amended, 1887, 1889, 1895. Cap. 246, R.S.O., 1897. Further amended, 1901, 1902, 1903, 1904, 1905, 1908, 1911, 1914.

Act Respecting Wages. Passed, 1888. Cap. 156, R.S.O., 1897, 1899. Consolidated and amended 1910. Previous Act repealed.

Workmen's Compensation for Injuries Act. Passed, 1886. Amended, 1887, 1893, 1896, 1899. Cap. 160, R.S.O., 1897. New Act, repealing this 1914.

Lord's Day Observance Act. Passed. 1885. Cap. 246, R.S.O., 1897, 1903, 1904.

Shops Regulation Act. Passed, 1888. Amended, 1889-1897. Cap. 257, R.S.O., 1897. Further amended, 1900, 1901,1903, 1904, 1908.

Egress from Public Buildings Act. Passed, 1888. Cap. 263, R.S.O., 1897.

Trades Disputes Act. Passed, 1890. Amended, 1894, 1897. Cap. 158, R.S.O., 1897. Further amended, 1902. Consolidated and amended, 1910. Previous Act repealed.

Woodmen's Lien Act. Passed, 1891. Amended, 1894, 1896, 1897, 1899. Cap. 154, R.S.O., 1897, 1903. Consolidated and amended, 1910. Previous Act repealed.

Act Respecting Stationary Engineers. Passed, 1891. Cap. 185, R.S.O., 1897, 1906, 1907, 1908, 1909. Consolidated and amended, 1911. Previous Act repealed 1914.

Miners Act. Passed, 1892. Cap. 36, R.S.O., 1897, 1905, repealed, 1906.

Matters under Municipal Act. 1892, 1893, 1894, 1895, 1898. Cap. 223, R.S.O., 1897, 1904, 1905, 1906.

Insurance by Trade Unions. Passed, 1892. Amended, 1897. Cap. 203, R.S.O., 1897.

Act Respecting School for Artisans. Passed, 1892. Amended, 1895. Cap. 223, R.S.O., 1897.

Act Respecting Truancy and Compulsory School Attendance. R.S.O., Cap. 196, 1897. Amended, 1904. New revised Act repealing this, 1909.

Act Respecting Lien for Wages on Street Railways. Passed, 1895. Cap. 208, R.S.O., 1897, 1906. (See Railway Act.)

Labour on Public Works. Passed, 1896. Amended, 1897. Cap. 155, R.S.O., 1897, 1900. Consolidated and Amended, 1910. Previous Act repealed.

Act Respecting Liability of Directors' Companies for Wages. Passed, 1896. Sec. 85, Cap. 191, R.S.O. 1897. Repealed 1907. (See Companies' Act.)

Act Respecting Liability of Mining Companies for Wages. Passed, 1896. Cap. 197, R.S.O., 1897, 1906. (See Mines Act.)

Act Respecting Technical Schools. Passed, 1897. Amended, 1911. Previous Act repealed.

Act Respecting Immigration of Children. Passed, 1897. Cap. 262, R.S.O., 1897.

Resolution Respecting Fair Wages on Public Works. Passed, 1900.

Act Creating Bureau of Labor. Passed, 1900. Revised, 1910. (See below.)

Act Respecting Mines. Passed, 1906, 1908, 1909, 1911, 1912, 1914.

Act Respecting Steam, Electric and Street Railways. Passed, 1906.

Act for Appointment of Railway and Municipal Board. (Trade Disputes provisions.) Passed, 1906. Amended, 1907.

Act Respecting Joint Stock and Other Companies. Passed, 1907, 1912.

Act Respecting the Manufacture and Sale of Bread. Passed, 1908.

Stenographic Reporters' Act. Consolidated, 1911. Old Act repealed.

Building Trades Protection Act. Passed, 1911.

Act Respecting Compulsory School Attendance of Adolescents, 1912.

The Mining Amendment Act, 1912, with respect to hours underground.

Employment Agencies Act, 1914.

AN ACT RESPECTING THE BUREAU OF LABOUR.

S. O. 1910, CAP. 13. *Assented to 7th March,* 1910.

His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

1. This Act may be cited as the Bureau of Labour Act.

2. There shall be attached to the Department of the Commissioner of Public Works a bureau, to be styled "The Bureau of Labour."

3. The Lieutenant-Governor may appoint a Secretary of the said Bureau and may also appoint such other officers as may be necessary for the proper conduct of the Bureau.

4. It shall be the duty of the Bureau to collect, assort and systematize and publish information and statistics relating to employment, wages and hours of labour throughout the Province—co-operation, strikes, lock-outs or other labour difficulties, trades unions, labour organizations, the relations between labour and capital, and other subjects of interest to working men, with such information relating to the commercial, industrial, and sanitary condition of working men, and the permanent prosperity of the industries of the Province, as the Bureau may be able to gather.

5. Chapter 14 of the Acts passed in the sixty-third year of Her Late Majesty's reign is repealed.

DOMINION LEGISLATION AFFECTING LABOUR

The White Phosphorus Act.

A complete review of An Act to Prohibit the Manufacture, Importation and Sale of Matches made with White Phosphorus was published in the May, 1914, issue of *The Labour Gazette*. Briefly, the measure is designed to eradicate a serious industrial disease known as necrosis, or "phossy jaw," frequently contracted by employees in match factories where white phophorus is used. The White Phosphorus Matches Act was introduced in the House of Commons by the Minister of Labour on March 11, and was assented to May 27.

The Explosives Act.

An Act to regulate the Manufacture, Testing, Storage and Importation of Explosives makes provision for the protection of employees engaged in such factories and of the public generally. No person except in licensed manufacturing factories is allowed to break up or unmake any explosive, to make fit for use any damaged explosive, or to make, alter, or repair any explosive, except in the case of thawing explosives containing nitroglycerine if a proper apparatus, or thawing house, is used in accordance with regulations made under the Act, or any Provincial law. Provision is made for the granting of licenses and permits by the Minister of Mines where the proper conditions are complied with. One of the requirements in an application for a license is a statement of the maximum number of persons to be employed in each building in the factory or magazine, or any person engaged in the handling or packing of explosives, or the transportation of explosives otherwise than by railway, and in regard to the construction, management and licensing of factories and magazines. Penalties are provided in the case of obstruction of entry and examination by inspectors, and of persons who, without permission or lawful authority, trespass upon any factory or magazine, and upon any person who commits any act likely to cause an explosion or fire to the Department of Militia and Defence or the Department of Naval Service.

ONTARIO

The Workmen's Compensation Act.

The new Workmen's Compensation Act, which was introduced in the Ontario Legislature March 17, was assented to May 1, and came into force Jan. 1, 1915.

The Old Act.

The present measure is an entire departure from the legislation heretofore existing in the Province of Ontario upon the subject of Workmen's Compensation. The former Act, which is repealed by the new measure, followed the lines of the British Employers' Liability Act of 1880, with some modifications. In order to better show the changes in principle which the new Act establishes, it may perhaps be of interest to refer briefly to the British Act of 1880, and to some of the circumstances which led up to the passing of that measure.

The British Act of 1880.

Up to the passing of the Employers' Liability Act in 1880, workmen in England had to rely for compensation for injuries under the common law, which provided for compensation only in the case of personal negligence of an employer. Under the common law of England, however, it was held, in the celebrated case of Priestly v. Fowler, a suit brought to recover compensation owing to the negligence of a fellow-employee, that a servant when he engaged to serve a master, undertook as between himself and his master, to run all the ordinary risks of the service, including the risk of negligence on the part of a fellow servant, and this principle, under the name of "the Doctrine of Common Employment," became established and stood for many years in the path of efforts on the part of workingmen and others to secure adequate compensation for injuries. The history of the attempt to improve in the interest of the workingmen the common law situation as above described is the history of the movement for "employers' liability" or "workmen's compensation" legislation.

The British Act of 1880, upon which, as has been stated, the old Ontario measure was largely modelled, while it did not entirely abolish the doctrine of common employment, secured its practical abolition in a number of special cases, namely, where the injury was due to any defect in plant or machinery, for which the employer or some person in his service was responsible; the neglect of any person engaged in superintendence: the neglect of any person whose orders the workmen were bound to obey when the injury took place: the act of any fellow servant done in obedience to any improper or defective rule or instruction of the employer or delegate; and the negligence of any signal men or person in charge of a locomotive and a railway.

The New Ontario Act.

The new Act passed by the Ontario Legislature is a complete reversal of the principle embodied in the old measure, in that whereas in the previous Act the doctrine of common employment obtained to some extent at least and it was necessary to show negligence on the part of the employer personally or on the part of those of his officers or employees engaged in the work of superintendence, leaving the onus of showing this negligence upon the person injured through an action in the courts or under arbitration proceedings, in the new measure the employer is presumed to be liable in all cases of injury in occupations to which the Act applies, the only exception being in cases where accident does not disable the workman for the period of at least seven days from earning full wages at the work at which he was employed, or in case the accident is attributable solely to the serious and wilful misconduct of the workman, and even in this latter event, where the injury results in serious disablement or death, the workman or his heirs are entitled to compensation.

Main Provisions.

The main provisions of the new Act may be briefly summed up as follows:

Any workman, except farm labourers, domestic or menial servants or their employers, and except those known as "out-workers," which is taken to mean a person to whom articles or materials are given out to be made up in his own

home or on other premises not under the control or management of the person who gave out the articles or materials, and except persons whose employment is of a casual nature, may receive compensation for injuries under the Act.

No employer can deduct, either directly or indirectly, any sum from the wages of any of his workmen or require or permit any of his workmen to contribute in any manner towards indemnifying the employer against liability incurred under the Act.

No sum allowed as compensation or any periodical payments as such can be assigned or attached.

Compensation may be made in a lump sum or in periodical payments.

The scale of compensation provides, amongst other things, where the injury results in death (*a*) for the payment of $75 for burial expenses; (*b*) $20 per month to the widow if the sole dependent, and (*c*) where there are children as well $20 per month to the widow and $5 to each child under 16; (*d*) $10 per month to each child under 16, where children are the sole dependents, payments in both cases not to exceed in the whole, $40. Where total disability results from the injury, the amount of the compensation shall be a weekly payment during the life of the workman equal to 55 per cent. of his average weekly earnings during the previous twelve months or for any less period during which he may have been employed. Where permanent partial disability results from the injury the compensation shall be a weekly payment of 55 per cent. of the difference between the average weekly earnings of the workman before the accident and the average amount which he is earning or is able to earn in some suitable employment or business after the accident, and the compensation shall be payable during the lifetime of the workman.

Provision is also made for the payment of compensation in cases of a workman suffering from an industrial disease and thereby disabled from earning full wages at the work at which he was employed, or where death is caused by such industrial disease and the disease is due to the employment in which he was engaged.

Other Provisions.

There are many other important provisions relating to the constitution of the Board which is to administer the Act, its powers, procedure and methods, the formation of associations and committees of employers, accident fund and assessments. Schedules showing what industries shall contribute to an accident fund and in what industries employers are individually liable to pay compensation, and giving a description of the industrial diseases covered by the Act are also included.

Mining Amendment Act, 1914.

The chief provision of this Act is the addition of a regulation regarding cages or skips.

The Employment Agencies Act.

An Act respecting Employment Agencies, which came into force July 1, 1914, defines an employment agency to mean and include the business of procuring for fee or reward, workmen, artificers, labourers, domestic servants, and other persons for the performance of skilled or unskilled labour, and the business of procuring for fee or reward, employment for any class of workmen, artificers,

labourers, domestic servants, and other persons, and it is required that no person shall carry on the business of such employment agency in Ontario without obtaining a license, which may be obtained from the Provincial Treasurer. Where an employment agency is carried on by any person by means of offices, branches or agents in different municipalities, a separate license is required for each such office, branch or agent, and a separate fee is payable. Every person who carries on the business of an employment agency without the required license is liable to a penalty of not less than $10 nor more than $500 recoverable before a police magistrate or two justices of the peace, and in default of payment may be imprisoned for a period of twelve months or until the penalty and costs are paid. Provision is also made for the proclaiming of regulations governing the conduct of the business of employment agencies; regarding fees; the security to be given by licensees for due observance of the Act and regulations; providing for returns to be made by persons to whom licenses are issued; for the inspection of employment agencies; for the revocation and cancellation of licenses for cause, and generally for the better carrying out of the provisions of the Act.

Stationary and Hoisting Engineers' Act.

An Act to amend the Stationary Engineers' Act amends the title of the old Act by adding the words "and Hoisting" and includes in the interpretation of the Act the definition of a "hoisting plant" which is described as meaning and including a steam boiler, a boiler and steam engine, and every part thereof, working at a pressure of 20 pounds or over irrespective of horse power, and used for hoisting in structural operations or excavating purposes.

Amendments to Factory Act.

The Factory, Shop and Office Building Act is amended by adding a clause providing for the inclusion in the duties of factory inspectors of work connected with the Stationary and Hoisting Engineers' Act as above mentoned. A section is also added providing that no Chinese person shall employ in any capacity or have under his direction or control any female white person in any factory, restaurant or laundry. It is also provided that no child between the ages of twelve and fourteen years employed in a canning factory shall be allowed to work more than eight hours per day. In the original Act ten hours per day was the limit set for children. The provisions of the original Act relating to boiler insurance and inspection are extended to include, after July 1, 1914, all boilers except those in residential buildings other than apartment houses and those used for agricultural purposes. A section is also added to that part of the original Act dealing with the regulation of elevators and hoists providing that in a factory, shop, or office building no person under the age of eighteen years shall be allowed regularly to operate or control an elevator.

QUEBEC

Amendment to Mining Act.

That part of the Quebec Mining Act which relates to the protection of workmen in mines is amended by the addition of a section to article 2,214 of the Revised Statutes respecting the sanitary condition and safety of the works and

mines. The new section provides that it shall be the duty of the inspector to make such inspection of mines, quarries and workshops for the reduction of minerals as may be necessary to insure the observance of all regulations respecting the sanitary condition and safety of the works in mines, and gives power to the inspector of mines to order any owner of a mine or his agents to have remedied within a certain lapse of time, specified by the inspector, any state of affairs or practices which he may consider bad or dangerous in the working of any mine, quarry or workshop for reducing minerals. Any failure to obey such notices within the time specified is made an offence punishable by penalties.

Employment Bureaus.

Article 2,520 of the Revised Statutes of 1909, as enacted by Chap. 19 of the Quebec Statutes of 1910, which provided that no private person should open or control an employment bureau for workmen without a license from the Minister of Public Works or Labour, and for inspection of bureaus by factory inspectors and for the making of reports to the Minister under penalty of a fine of fifty dollars, has been replaced by a section which provides that application for permission to open an employment bureau may be made not only to the Minister but to the chief factory inspector, and that the Minister, on favourable reports from the inspector, who has visited the premises, to open such bureau, may grant a non-transferable permit to the person mentioned therein, to open or control an employment bureau, such permit to be granted for one year or a fraction of a year only, and to expire on the first day of May following its issue. New sections added to the Act provide that every person controlling an employment bureau other than an employment bureau for women only, shall be responsible for conducting such bureau as required by law, and must keep a register in French and English, make a monthly return to the inspector setting out the number of workmen registered, their country of origin, the name of the person with whom such workmen have been placed, the total amount of fees received by the person in charge of the bureau, or by his agents, and furnish each year to the inspector a certificate from the local Board of Health to the effect that the sanitary condition of the bureau is satisfactory. Receipt forms must be approved by the inspector before being used. No employment bureau shall be kept in or in the immediate proximity of a building where intoxicating liquors are sold. The registration fee paid by work people shall not be more than three dollars, and it is required that in addition to obtaining a permit the keepers of employment bureaus, other than an employment bureau for women only, must first obtain a license to be issued on payment of an annual duty of two hundred dollars for cities and towns in which there are one or more free employment bureaus, and an annual duty of twenty-five dollars in other localities where there is no such free employment bureau, and every person keeping and controlling an employment bureau without holding such permit and license shall be liable to a fine not exceeding five hundred dollars and costs for each contravention. Power is also given to the Minister to at any time revoke the permit, the revocation of a permit operating also as a revocation of the license. The license mentioned is not required in the case of benevolent societies or workmen's associations which endeavour to find employment for their members.

Technical Schools.

An Act respecting the establishment of technical and vocational courses in the province recites that it is of importance for the needs of trade, industry and agriculture to promote the establishment of technical schools and vocational courses for the purposes of training in the various centres of the province skilled mechanics or employees needed by heads of industrial enterprises and farmers, and provides that any public or private body may, by observing certain formalities set out in the Act, obtain a charter authorizing the establishment of a technical school or vocational course for the local needs of a specified district.

Stationary Engineers.

Sections are added to that part of the Act relating to public health and safety having to do with inspection of industrial establishments, which provide for the appointment of a board of examiners to hold examinations as to the efficiency of those who are or wish to become stationary engineers, and grant diplomas of efficiency. It is provided also that the Lieutenant-Governor-in-Council may make regulations as to the method of examining candidates, the tariff of fees to be paid, and to regulate the installation of motive power.

Workmen's Compensation.

In an Act respecting damage to persons, it is recited that certain doubts having arisen as to the effect that certain sections of the Revised Statutes, 1909, might have upon the common law right of action, and that it is expedient to put an end to such doubts, article 7,329 of the Revised Statutes which provides that as soon as permanent incapacity to work is ascertained, or in case of death, of the person injured, within one month from the date of the agreement between the employers and parties interested, or if there be no agreement, within one month from the date of the final judgment condemning him to pay the same, the employer shall pay the amount of compensation to the person injured or his representative, or the capital of the rent to an insurance company designated for that purpose by order-in-council, is amended by adding a section which provides that the person injured or his representative may, at their option, demand the payment to themselves of the amount of the compensation, or of the capital of the rent, which shall in no case exceed two thousand dollars, whether in case of death or incapacity, which would entitle him to an annual rent, except in such cases where the accident was brought about intentionally by the person injured. Article 7,347 of the Revised Statutes, which provides that before having recourse to the provisions of the Workmen's Compensation Act, a workman must have the authority of a judge of the Superior Court, has had added to it a section which conserves to injured persons their common law rights of action in cases where they cannot avail themselves of certain provisions of the Workmen's Compensation Act. The amendments do not affect pending cases.

Workmen's Liens.

An Act to amend the Civic Code relating to privileges of certain workmen on moveable property gives to workmen who have worked for persons giving theatrical

or other profit-making exhibitions, including circuses, a privilege upon things used for the purposes of such exhibitions, and which belong to such persons for thirty days' salary due and unpaid.

Barbers' Association.

The Barbers' Association of Quebec, which was incorporated by Act of the Quebec Legislature in 1899, for the purpose of regulating the barbers' trade, of securing better apprenticeship, of requiring examinations and of granting licenses to persons wishing to ply the same, and with the view of causing the laws of hygiene to be observed by its members, and thereby protecting health, was dissolved, for the reason, as stated in the preamble of the amending Act, that the Barbers' Association had not attained and could not, even in the opinion of those who formed part thereof, attain the object for which it was incorporated. Under the old measure no person was allowed to ply the trade of barber without a license from the Association, and any person who, without a license from the Association, did so ply the trade of barber was considered to be doing so illegally, and was subject to a fine.

SASKATCHEWAN

An Act to Amend the Steam Boilers Act.

Amendments to the Steam Boilers Act were passed affecting the grading of engineers' certificates. The large number of small stationary boilers up to about 100 horse power has made it necessary to issue a special grade of certificate suitable to these plants. This has been done by dividing the present third class engineers' certificate into two classes, namely, traction engineers' final certificates and stationary engineers' certificates. The traction engineers' final certificate will practically take the place of the old third class, the qualifications required and the standard examination being almost the same as hitherto. This grade of certificate will therefore be particularly adapted to engineers operating agricultural machinery, traction engines and the like. The new grade, which will be known as the third class stationary engineer's certificate, will be intermediate between the old third class and the second class engineer's certificate, and will entitle the holder to have sole charge of boilers up to 100 horse power, or to act as assistant in the operation of a boiler or battery of boilers up to 300 horse power, provided that a holder of a first or second class engineer's certificate is in actual charge. The qualification required before taking examination for this grade of certificate is that the candidate since receiving a provisional or final engineer's certificate shall have had at least three months' experience of stationary engines. A further alteration in the Act has been made by extending the scope of firemen's certificates to cover the operation of small high pressure boilers used for heating purposes only, in industrial processes. There are a large number of these boilers now in use in the Province, used for vulcanizing automobile tires, stereotyping, etc., and as there is no engine attached, the boilers being only used for heating purposes, the owners of such boilers are no longer required to employ a certified engineer. In such cases inspectors now have discretionary powers to issue a fireman's certificate to the person in charge of such boilers, upon being satisfied that he has sufficient knowledge to operate the same with safety. Firemen's certificates are issued for a period of not more than three months, and must therefore be renewed periodically.

Mechanics' Liens.

The Mechanics' Lien Act is amended by requiring the person filing a lien to swear to the date upon which the contract or service was completed or was to be completed. Hitherto it has been found possible to make the affidavit prescribed by the Act and to file stale and illegal claims to the annoyance of the owners and subsequent incumbrances. The procedure under the Act is simplified by rendering it unnecessary to make lien holders parties defendant to actions. Hereafter they will be simply served with notice of trial.

Protection of Employees.

An Act was passed providing for the safety of electrical workers. It is thought that such legislation will not only provide additional safeguards for such employees, but will enable them to procure insurance upon somewhat less prohibitive terms than previously. The Act consists of a preamble setting out the fact that this class of workmen have to carry on their labours under conditions of danger, and that it is expedient to make regulations to provide for their safety, and two sections which are given in full are: (1) The Lieutenant-Governor-in-Council may, from time to time, make and may subsequently alter or revoke regulations governing the construction, maintenance, and use of electric wires, wiring apparatus and appliances, poles, cables and fixtures for electric light, heat, or power, telegraph, telephone or other purposes. (2) Every Order-in-Council containing such regulations shall fix the date upon which the regulations shall come in force, and such regulations shall be published in two consecutive issues of *The Saskatchewan Gazette* prior to such date. An amendment was made to the Building Trades Protection Act. This Act formerly provided for certain protection for workmen employed upon the erection of buildings of two storeys. The wording has now been altered so as to cover all buildings over twenty feet in height. This will include churches, warehouses and such buildings as have but one storey, but which are of considerable height. It is also provided that all ladders shall be three rungs higher than the platform which they reach, so as to ensure more safety for workmen.

Employment Agencies.

An Act was passed respecting Employment Agencies, among the principal features of which are sections providing that all employment agents must be licensed by the council of the municipality in which they operate, and the council may prescribe the fee which may be charged. Every agent must furnish a bond for $1,000 in favour of the Attorney-General of Saskatchewan, for the due fulfilment of his duties and obligations under this Act, or to cover any penalties which he may incur through the breach of it. Each agent must keep a register in which he shall enter all particulars about any applicant for work, and also of details regarding employers. This record must be open to the inspection of the municipal authorities, and also of the secretary of the Bureau of Labour. Every person securing a position through an employment agent is entitled to receive a receipt showing all particulars of the transaction, such as the amount of the fee paid, the wages to be paid, and the name of the employer and of the employment agent. There is to be no registration fee charged, and the fee for

obtaining employment must not exceed five per cent. of the first month's wages if the employment is to be for a month or more, otherwise the maximum fee must not be more than $1. No agent shall divide fees with any superintendent, manager, foreman or other employee of any person or corporation requiring help.

NOVA SCOTIA

Inspection of Steam Boilers.

An Act respecting the Inspection of Steam Boilers provides for the inspection of steam boilers used for generating steam for heating and power purposes, and all attachments in connection therewith, save such boilers as may be in use in a private residence, apartment house, office building, church, hotel, or public building used exclusively for heating purposes and provided with a device for limiting pressure; portable boilers rated at 25 horse power or under; or boilers used exclusively for horticultural or agricultural purposes, and railway locomotives. Regulations may be prescribed by the Governor-in-Council respecting the material and specifications connected with boiler construction. Provision is also made for the appointment of inspectors and the employment of boiler insurance companies to make inspections, whose certificate may be accepted in lieu of certificates by inspectors appointed under the Act. No person directly or indirectly interested in the manufacture or sale of steam boilers or steam machinery may be an inspector, and full power is given inspectors to enter upon any lands or buildings for the purposes of inspection, anyone obstructing or interfering with such inspector in the course of his duties being subject to a penalty not exceeding $50. Inspectors are also empowered to examine persons under oath in regard to matters pertaining to the construction, alteration or repairs of a steam boiler or its removal from any place in which it has been constructed, altered or repaired.

Special Inspections.

In addition to the annual inspection the inspector is required to examine at any time, when, in his opinion, such examination may be necessary, any steam boiler which may be reported to him to be unsafe, and to notify the owner or person using such boiler of any defects or repairs necessary to be made to render the same safe. Any boiler declared unsafe by an inspector shall not be used until such repairs as ordered by the inspector have been made and the certificate required duly issued, the penalty provided for failure to comply with this provision being $50. Inspectors are required to keep a true record of all boilers inspected by them and all repairs ordered; of all steam boilers condemned by them as unsafe, and of all accidents to boilers by explosions or otherwise which come to their knowledge.

Other Provisions.

Other provisions provide for notification of the Commissioner in cases where boilers are sold or exchanged, the cancellation of certificates for cause, and for the report of the Chief Inspector to the Commissioner of all inspections and of accidents and casualties throughout the year. The specifications provided for in the Act are stated not to apply to a new boiler in the possession of a manufacturer or dealer on July 1, 1914, nor a boiler under construction on that date, nor a second-hand boiler, unless the same is rebuilt or extensively altered after that date.

Workmen's Compensation.

An Act respecting the Laws Relating to the Liability of Employers to make Compensation to their Employees for Injuries Received in the Course of their Employment, gives power to the Governor-in-Council to appoint a commission of three or more members, whose duty it shall be to examine into and report as to the laws in force in the Province of Nova Scotia relating to the liability of employers to make compensation to their employees for injuries received in the course of their employment; to examine into and report on the societies exempted from the operation of Chapter 3, Acts of 1910, and the terms and conditions under which such societies should continue to be exempted or otherwise, and to submit to draft bill in accordance with such report. The societies referred to as exempted from the operation of the operation of the Workmen's Compensation Act of 1910 are those existing at certain collieries in the Province at which miners' relief societies have been established.

Railway Legislation.

Chapter 99 of the Revised Statutes of 1900, "The Nova Scotia Railway Act," is amended by adding to Section 235, which relates to appliances for communication and for stopping trains, the following sub-section: "Every railway company shall, before December 31, 1917, equip all rolling stock with couplers which couple automatically by impact, and which can be uncoupled without the necessity of men going in between the ends of the cars. Any railway company which fails to comply with the provisions of the last preceding sub-section shall be liable to a penalty of not less than two hundred dollars for each and every failure to comply therewith." Another section is also added to Section 253 of the original Act relating to the packing of frogs and safety appliances, by which it is provided that all companies operating steam locomotives, except for yard service, shall, on or before December 31, 1917, equip such locomotives as may be in use with ash pans that can be dumped or emptied without the necessity of any employee going under such locomotives except in cases of emergency.

Mechanics' Liens.

The law relating to Mechanics' Liens is amended by repealing that section in the original and amending Acts relating to jurisdiction and procedure, by which it was required that a statement of claim filed in the office of the clerk of the court should be verified by an affidavit in a form shown in a schedule attached to the Act. The present law dispenses with the need for an affidavit, and strikes out the form of schedule formerly required to be followed in making the affidavit.

Coal Mines Regulation.

A number of amendments are made to the Coal Mines Regulation Act of 1908 and amending Acts. That part of the law relating to the establishment of boards of examiners for the purpose of recommending certificates of competency to managers, underground managers and overmen, is changed by repealing a former section, which required as members of an examining board to mechanical engineers holding first-class certificates of competency, and by the addition of sections providing that no person shall be entitled to a certificate of competency as

a manager, underground manager, or overman who is not a British subject of the full age of 21 years and has not had at least four years' experience underground in a coal mine, one year of which must have been at the working face; that this candidate for a certificate of competency as a manager must be the holder of a certificate of competency as an underground manager, and have served one year at a working face and one year as an overman or examiner.

LIST OF LABOUR BUREAUS AND WHEN ORGANIZED

During the past forty years labour's interests have become so important a factor with representative Governments throughout the world that they deemed it necessary to create Labour Bureaus for the purpose of collecting accurate statistics of the progress of a nation's prosperity arising from commercial, mechanical and agricultural pursuits. The success of these undertakings has proved most satisfactory, as is shown by the following list of Labour Bureaus compiled from official records:—

Ontario.—The Bureau of Labour was created by an Act passed by the Ontario Legislature, April 25th, 1900, and amended in 1910. The Department is under the direction of Hon. Finlay G. Macdiarmid, Minister of Public Works. Secretary of the Labour Bureau, Robert Edgar, Toronto, Ont.

Saskatchewan.—Secretary Bureau of Labour, Thos. M. Molloy, Regina, Sask.

Canada.—The Department of Labour was established in July, 1900, and practically supersedes the Bureau of Labour of the Department of Agriculture, established in 1890, with Mr. George Johnson as chief clerk. The Department is now a separate portfolio, with Hon. T. W. Crothers as Minister. The Act establishing the Department provides for the monthly issuing of a Labour Gazette, the editor of which is F. A. Acland, Deputy Minister of Labour. The first number of the *Gazette* was issued in September, 1900.

Great Britain.—The Labour Bureau of the Board of Trade was established March 2nd, 1886. In 1893 the service was greatly enlarged, and given its present name, "Board of Trade Labour Department." A. Wilson Fox, Chief Secretary. It publishes monthly the *Labour Gazette*; also annual reports.

New Zealand Department of Labour.—The Right Hon. J. A. Miller, Minister of Labour. E. Tregear, Secretary, Wellington, N.Z.

New South Wales.—Department of Labour and Industry. T. B. Clegg, Chief Clerk, Sydney, N.S.W.

Queensland.—Department of Immigration.—Government Labour Bureau and Relief. Chief Clerk, Brisbane, Queensland.

South Australia Labour Bureau.—Chief Clerk, A. C. H. Richardson, Adelaide, South Australia.

West Australia.—Government Statistician, Malcolm A. C. Fraser, Perth, West Australia.

United States Department of Labour.—Established as a Bureau of Labour, January 31st, 1885; made a department of Labour, June 13th, 1888. Bi-monthly bulletins. Annual reports. Commissioner of Labour, Chas. P. Neill, Washington, D.C.

United States Census Office.—E. Dana Durand, Director of Census, Washington, D.C.

California Bureau of Labour Statistics.—Established March 3rd, 1883. Biennial reports. Commissioner of Labour, John P. McLaughlin, San Francisco, Cal.

Colorado Bureau of Labour Statistics.—Established March 24th, 1887. Biennial reports. Commissioner of Labour, E. V. Brake, Denver, Col.

Connecticut Bureau of Labour Statistics.—Established July 12th, 1873. Abolished July 23rd, 1875. Re-established April 23rd, 1885. Annual reports. Commissioner of Labour, Patrick H. Connolly, Hartford, Conn.

Illinois Bureau of Labour Statistics.—Established May 29th, 1879. Biennial reports. Commissioner of Labour, David Ross, Springfield, Ill.

Iowa Bureau of Labour Statistics.—Established April 3rd, 1884. Biennial reports. Commissioner of Labour, A. L. Urick, Des Moines, Ia.

Indiana Bureau of Labour Statistics.—Established March 29th, 1879. Biennial reports. Commissioner of Labour, Jno. J. Walsh, Indianapolis, Indiana.

Kansas Bureau of Labour Statistics.—Established March 5th, 1885. Annual reports. Commissioner of Labour, W. L. O'Brien, Topeka, Kansas.

Kentucky Bureau of Agriculture, Labour and Statistics.—First established March 20th, 1876, as a Bureau of Agriculture, Horticulture and Statistics; the duties of the Bureau were enlarged and the present name adopted April 2nd, 1892. Biennial reports. Commissioner of Agriculture, Labour and Statistics, J. W. Newman, Frankfort, Ky.

Louisiana Bureau of Statistics of Labour.—Established July 9th, 1900. Biennial reports. Commissioner of Labour, Wm. McGilvary, New Orleans, La.

Maine Bureau of Labour and Industry.—Established March 7th, 1887. Annual reports. Commissioner of Labour, Jno. F. Connolly, Augusta, Maine.

Maryland Bureau of Statistics and Labour.—Established March 27th, 1884. Annual reports. Labour Commissioner, Frank A. White, Baltimore, Md.

Massachusetts Bureau of Labour and Industries.—Established June 23rd, 1869. Quarterly bulletins. Annual reports. Commissioner of Labour, Jas. A. Lowell, Boston, Mass.

Michigan Bureau of Labour.—Established June 6th, 1883. Annual reports. Commissioner of Labour, Jas. F. Cunningham, Lansing, Mich.

Minnesota Bureau of Labour.—Established as a Bureau of Labour Statistics, March 8th, 1887; enlarged and changed to the Bureau of Labour, April, 1893. Biennial reports. Commissioner of Labour, Wm. F. Houk, St. Paul, Minn.

Missouri Bureau of Labour.—Established March 19th, 1879; enlarged March 23rd, 1883. Annual report. Commissioner of Labour, John T. Fitzpatrick, Jefferson City, Mo.

Nebraska Bureau of Labour.—Established March 31st, 1887. Biennial reports. Commissioner of Labour, Chas. W. Pool, Lincoln, Neb.

Montana Bureau of Agriculture, Labour and Industry.—Established February 17th, 1893. Annual reports. Commissioner of Labour, J. H. Hall, Helena, Mont.

New Hampshire Bureau of Labour.—Established March 30th, 1893. Biennial report. Commissioner of Labour, J. S. B. Davie, Concord, N.H.

New Jersey Bureau of Labour.—Established March 27th, 1878. Annual report. Commissioner of Labour, Louis T. Bryant, Trenton, N.J.

New York Bureau of Labour.—Established May 4th, 1883. Quarterly bulletins. Annual reports. Commissioner of Labour, James M. Lynch, Albany, N.Y.

North Carolina Bureau of Labour.—Established February 28th, 1887. Annual reports. Commissioner of Labour, M. L. Shipman, Raleigh, N.C.

North Dakota Department of Agriculture and Labour.—Established October 1st, 1890. Biennial Reports. Commissioner of Labour, W. C. Gilbreath, Bismarck, N.D.

Ohio Bureau of Labour.—Established May, 1887. Annual report. Commissioner of Labour, Fred. Lange, Columbus, Ohio.

Oklahoma Bureau of Labour.—Established September, 1907. Commissioner of Labour, Chas. L. Daugherty, Oklahoma City, Okla.

Oregon Bureau of Labour.—Established June 3rd, 1903. Biennial reports. Commissioner of Labour, O. P. Hoff, Salem, Oregon.

Pennsylvania Bureau of Labour and Industry.—Established April 12th, 1872. Annual reports. Commissioner of Labour, J. P. Jackson, Harrisburg, Pa.

Rhode Island Bureau of Labour.—Established March 29th, 1887. Annual report. Commissioner of Labour, J. E. Hudson, Providence, R.I.

South Carolina Department of Agriculture, Commerce and Industries.—Reorganized 1909. Commissioner, E. J. Watson, Columbia, S.C.

Tennessee Bureau of Labour.—Established 1891. Commissioner of Labour, W. L. Mitchell, Nashville, Tenn.

Texas Bureau of Labour.—Commissioner of Labour, J. A. Starling, Austin, Texas.

Washington Bureau of Labour.—Established June 11th, 1897. Annual report. Commissioner of Labour, E. W. Olson, Olympia, Wash.

Wisconsin Bureau of Labour.—Established April 3rd, 1883. Biennial reports. Commissioner of Labour, J. D. Beck, Madison, Wis.

West Virginia Bureau of Labour.—Established February 22nd, 1889. Annual reports. Commissioner of Labour, I. V. Barton, Wheeling, W. Va.

Idaho Bureau of Labour.—Established March 11th, 1895. Annual reports. Commissioner of Labour, J. P. Fallon, Boise City, Idaho.

Virginia Bureau of Labour.—Established March 3rd, 1898. Annual reports. Commissioner of Labour, J. B. Doherty, Richmond, Va.

Porto Rico Bureau of Labour.—Established 1912. Chief J. C. Bills, Jr., San Juan, Porto Rico.

Argentine Republic.—Francoise Latzina, Director General de la Statistique de la Republique Argentina (Ministere de l'Interieur),, Buenos Ayres.

Austria-Hungary.—Commission Central of Statistics (Minister of Public Instruction). Dr. Karl Theodor von Inama Sternegg, President, Vienna. Department of Municipal Statistics, Dr. Sedlatzek, Chief, Vienna.

Bavaria.—Royal Bureau of Statistics (Department of Interior). Karl Rasp, Director, Munich.

Belgium.—Royal Bureau of General Statistics (Minister of the Department of the Interior and Public Instruction). Edmund Nicoali, Chief, Brussels.

Brazil.—Dr. R. Pompeia, Director de Bureau de Statistique des Etats Unis du Bresil (Ministere de l'Interieur), Rio Janeiro.

Bulgaria.—Bureau of Statistics of Bulgaria (Minister of Public Instruction). F. Ivanchoff, Director, Sofia.

Chili.—Don Francisco S. Asta Burnaga, Chef du Bureau Central de Statistique de Chili, Santiago.

Denmark.—Royal Bureau of Statistics (Minister of Finance). Marius de Gad, Director, Copenhagen.

France.—Office du Travail, Ministere du Travail, Paris.

Victor Furquan, Chef du Bureau de la Statistique General de France (Ministere du Commerce et de l'Industrie).—Office du Travail, Paris.

Germany.—Imperial Office of Statistics (Department of Interior). Dr. F. W. Hans Von Schell, Director, Berlin.

Herzegovina.—Bureau of Statistics of Bosnia and Herzegovina. Dr. Ferdinand Schmidt, Director, Sarajevo.

Holland.—Herr Methour, Director of Netherlands Statistical Central Office, La Haye, Netherlands.

Italy.—Directeur General de la Statistique du Royaume, G. Montemartini, Director dell' Offices del Lavoro (Ministere de l'Agriculture, de l'Industrie, et du Commerce), Rome.

Japan.—N. Hanusa, Chef du Bureau General de la Statistique (Cabinet Imperial), Tokio.

Mexico.—Antonio Penafiel, Directeur General de la Statistique de la Republique (Mexicaine du Fomento), Mexico.

Paraguay.—I. Jasquet, Director General de la Statistique du Paraguay, Assumption.

Portugal.—Ernesto Madeiro Pinto, Director General of Statistics of Commerce (Minister of Public Works, Commerce and Industries), Lisbon.

Prussia.—Royal Bureau of Statistics (Minister of the Department of the Interior). Karl Julius Emil Blenck, Director, Berlin.

Office of the Statistics of the City of Berlin. Dr. Richard Bockh, Director, Berlin.

Roumania.—C. E. Cupenski, Director de la Statistique General du Royaume (Minister de l'Agriculture, de l'Industrie, du Commerce, et des Domaines), Bucharest.

Russia.—Bureau, Directeur du Comite Central de Statistique (Ministere de l'Interieur), Petrograd.

B. Grigoreff, chef Bureau de la Statistique Municipale, Moscow.

Saxony.—Bureau of Statistics of the Minister of State. Dr. Victor Bohmert, Director, Dresden.

Spain.—Ing. Francisco de Paulo de Arrillaga, Director General of the Geographic Institute and Bureau of Statistics of Spain, Madrid.

Styria.—Bureau of Statistics of Styria. Dr. Ernest Michler, Director, Gratz.

Sweden.—Dr. Elis Sidenbaldh, Director en Chef du Bureau Central de Statistique de Royaume (Minister de l'Interieur, Stockholm).

Norway.—Anders Nicolaikiser, Directeur du Bureau Central de Statistique du Royaume (Ministere de l'Interieur), Christiana.

Switzerland.—Dr. Louis Guillaume, Directeur du Bureau Federal de Statistique (Ministere de l'Interieur), Berne.

Stephen Bauer, Office International du Travail, Basle, Switzerland.

Uruguay.—Honore Roustan, Director du Bureau de la Statistique General, Montevideo.

LIST OF NATIONAL AND INTERNATIONAL LABOUR ORGANIZATIONS

With Names and Addresses of General Secretaries, Having Subordinate Organizations in the Province of Ontario.

Trades and Labour Congress of Canada, P. M. Draper, Box 1017, Ottawa, Ont.

American Federation of Labour, Frank Morrison, 801-9 G. Street, N.W., Washington, D.C.

Actors' Union of America, White Rats, W. W. Waters, 227-231 W. 46th Street, New York, N.Y.

Asbestos Workers of America, T. J. McNamara, 2516 Slattery Street, St. Louis, Mo.

Bakery and Confectionery Workers International Union of America, O. E. Fischer, 212 Bush Temple of Music, Chicago, Ill.

Barbers' International Union of America, Journeymen, Jacob Fischer, 222 E. Michigan Street, Indianapolis, Ind.

Bartenders' International League of America, J. L. Sullivan, Commercial Tribune Building, Cincinnati, Ohio.

Bill Posters and Billers of America, International Alliance of, W. McCarthy, 809 Fitzgerald Building, 1482-90 Broadway, New York, N.Y.

Blacksmiths and Helpers, International Brotherhood of, W. F. Kramer, 570-585 Monon Building, Chicago, Ill.

Boilermakers, Iron Shipbuilders and Helpers of America, International Brotherhood of, W. J. Gilthorpe, 7-12 Law Building, Kansas City, Kansas.

Bookbinders, International Brotherhood of, J. W. Dougherty, 222 E. Michigan Street, Indianapolis, Ind.

Boot and Shoe Workers' Union, C. L. Baine, 246 Summer Street, Boston, Mass.

Brewery Workmen of America, International Union of the United, J. Proebstle, 2347-51 Vine Street, Cincinnati, Ohio.

Brick, Tile and Terra Cotta Workers' Alliance, International, W. Van Bodegraven, 2341 W. 12th Street, Chicago, Ill.

Bricklayers', Masons' and Plasterers' International Union of America, W. Dobson, University Park Building, Indianapolis, Ind.

Bridge and Structural Iron Workers, International Association of, H. Jones, 422-424 American Central Life Building, Indianapolis, Ind.

Broom and Whiskmakers' Union, International, W. R. Boyer, 851 King Place, Chicago, Ill.

Brushmakers' International Union, G. J. Vitzthun, 2052 Gates Avenue, Brooklyn, N.Y.

Building Labourers, International Protective Union of, S. P. Johnson, 2326 E. Eighth Street, Los Angeles, Cal.

Car Workers, International Association of, G. W. Gibson, Room 1209-10, Star Building, 538 S. Dearborn Street, Chicago, Ill.

Carpenters and Joiners, Amalgamated Society of, T. Atkinson, Room 76, Bible House, New York, N.Y.

Carpenters and Joiners of America, United Brotherhood of, F. Duffy, Carpenter's Building, 222 E. Michigan Street, Indianapolis, Ind.

Carriage, Wagon and Automobile Workers of North America, International Union of, W. P. Mavell, 30 Chapin Block, Buffalo, N.Y.

Carvers' Association of North America, International Wood, T. J. Lodge, 10 Carlyle Street, Grove Hall, Mass.

Cement Workers, American Brotherhood of, H. J. Ullner, 705 Clunie Building, California and Montgomery Streets, San Francisco, Cal.

Cigarmakers' International Union of America, G. W. Perkins, 820 Monon Building, Chicago, Ill.

Clerks' International Protective Association, Retail, H. J. Conway, Lock Drawer 248, Lafayette, Ind.

Cloth Hat and Capmakers of North America, United, Max Zuckerman, 62 E. Fourth Street, New York, N.Y.

Commercial Telegraphers' Union of America, The, W. Russell, 922-930 Monon Building, Chicago, Ill.

Compressed Air and Foundation Workers, International Union of, J. G. Andrew, 309 Bloomfield Street, Hoboken, N.J.

Coopers' International Union of North America, W. R. Deal, Bishop Building, Kansas City, Kansas.

Cutting Die and Cutting Makers, International Union of, W. Bondy, 727 Manida Street, Bronx, N.Y.

Electrical Workers, International Brotherhood of (A.F. of L.), C. P. Ford, Pierik Building, Springfield, Ill.

Electrical Workers, International Brotherhood of, J. W. Murphy, Box 42, Springfield, Ill.

Elevator Constructors, International Union of, W. Young, Room 418, Perry Building; 16th and Chestnut Streets, Philadelphia, Pa.

Engineers, Amalgamated Society of, W. Delahay, American Council, 309 Broadway, New York, N.Y.

Engineers, International Union of Steam and Operating, J. G. Hannahan, 6334 Yale Avenue, Chicago, Ill.

Firemen, International Brotherhood of Stationary, C. L. Shamp, 3615 N. 24th Street, Omaha, Neb.

Foundry Employees, International Brotherhood of, G. Bechtold, 200 S. Broadway, St. Louis, Mo.

Freight Handlers, Brotherhood of Railroad, G. H. Kroeger, 816-24 Harrison Street, Chicago, Ill.

Fur Workers of the United States and Canada, International, S. Korman, 32 Union Square, New York, N.Y.

Garment Workers of America, United, B. A. Larger, 116-122, Bible House, New York, N.Y.

Garment Workers' Union, International Ladies', J. A. Dyche, 32, Union Square, New York, N.Y.

Glass Bottle Blowers' Association of the United States and Canada, W. Launer, 930-932 Witherspoon Building, Juniper and Walnut Streets, Philadelphia, Pa.

Glass Snappers' National Protective Association (Window), L. L. Jacklini, Kane, Pa.

Glass Workers' International Association of America, Amalgamated, A. J. Scott, Room 204, 118 E. 28th Street, New York, N.Y.

Glass Workers of America, National Window, C. Bryant, 417-420 Electric Building, Cleveland, Ohio.

Glass Workers' Union, American Flint, W. P. Clarke, 928-931 Ohio Building, Toledo, Ohio.

Glove Workers' Union of America, International, Miss E. Christman, 506 Bush Temple of Music, Chicago, Ill.

Granite Cutters' International Association of America, The, J. Duncan, Hancock Building, Quincy, Mass.

Grinders' and Finishers' National Union, Pocket Knife Blade, F. A. Didsbury, 508 Brook Street, Bridgeport, Conn.

Hatters of North America, United, M. Lawlor, 11 Waverly Place, New York, N.Y.

Hod Carriers' Building and Common Labourers' Union of America, International, A. Persion, Box 597, Albany, N.Y.

Horseshoers, International Union of Journeymen, H. S. Marshall, 605 Second National Bank Building, Cincinnati, Ohio.

Iron, Steel and Tin Workers of the United States, Amalgamated Association of, M. F. Tighe, 501 House Building, Smithfield and Water Streets, Pittsburg, Pa.

Lathers' International Union, Wood, Wire and Metal, R. V. Brandt, 401 Superior Building, Cleveland, Ohio.

Laundry Workers' International Union, H. L. Morrison, 604 Second Avenue, Troy, N.Y.

Leather Workers on Horse Goods, International United Brotherhood of, J. J. Pfeiffer, 504-5 Postal Building, Kansas City, Mo.

Leather Workers' Union of America, Amalgamated, J. J. Brennan, 223 Perry Street, Lowell, Mass.

Lithographers' International Protective and Beneficial Association of the United States and Canada, J. M. O'Connor, Langdon Building, 309 Broadway, New York, N.Y.

Lithographic Press Feeders, International Protective Association of, H. C. Kranz, 200 E. 23rd Street, New York, N.Y.

Locomotive Engineers, Brotherhood of, W. B. Prenter, 1118 B of L. E. Building, Cleveland, Ohio.

Locomotive Firemen and Enginemen, Brotherhood of, A. H. Hawley, Peoria, Ill.

Longshoremen's Association, International, J. J. Joyce, 702 Brisbane Building, Buffalo, N.Y.

Machine Printers and Colour Mixers of the United States, National Association of, P. E. Lyons, 334 Trenton Avenue, Buffalo, N.Y.

Machinists, International Association of, G. B. Preston, McGill Building, 908-914 G. Street, N.W., Washington, D.C.

Maintenance of Ways Employees, International Brotherhood of, S. J. Pegg, 27 Putnam Avenue, Detroit, Mich.

Marble Workers, International Association of, S. C. Hogan, 406 E. 149th Street, New York, N.Y.

Meat Cutters and Butcher Workmen of North America, Amalgamated, H. D. Call, 212 May Avenue, Syracuse, N.Y.

Metal Polishers', Buffers', Platers', Brass and Silver Workers' Union of North America, C. R. Atherton, Neave Building, Cincinnati, Ohio.

Metal Workers' International Alliance, Amalgamated Sheet, J. E. Bray, 407 Nelson Building, Kansas City, Mo.

Mine Workers of America, United, W. Green, 1106 State Life Building, Indianapolis, Ind.

Miners, Western Federation of, E. Mills, 503-511 Denham Building, Denver, Col.

Moulders' Union of North America, International, V. Kleiber, 530 Walnut Street, Cincinnati, Ohio.

Musicians, American Federation of, O. Miller, 3535 Pine Street, St. Louis, Mo.

Painters, Decorators and Paperhangers of America, Brotherhood of, J. C. Skemp, Box 99, Lafayette, Ind.

Paper Makers, International Brotherhood of, J. T. Carey, 127 N. Pearl Street, Albany, N.Y.

Patternmakers' League of North America, J. Wilson, 1008-1009 Second National Bank Building, Cincinnati, Ohio.

Pavers, Rammermen, Flag-layers, Asphalt Workers, Bridge and Stone Curb Setters, International Union of, E. I. Hannah, 223 E. 59th Street, New York, N.Y.

Paving Cutters' Union of the United States and Canada, Carl Bergstrom, Lock Box 27, Albion, N.Y.

Photo Engravers' Union of North America, International, L. A. Schwarz, 5609 Germantown Avenue, Philadelphia, Pa.

Piano, Organ and Musical Instrument Workers' Union, International, C. Dold, 1037 Greenwood Terrace, Chicago, Ill.

Plasterers' International Association, Operative, T. A Scully, 442 E. Second Street, Middletown, Ohio.

Plate Printers' Union, International Steel and Copper, C. T. Smith, 612 F. Street, N.W., Washington, D.C.

Plumbers and Steamfitters, United Association of, T. E. Burke, 411-416 Bush Temple of Music, Chicago, Ill.

Post Office Clerks, National Federation of, G. F. Pfeiffer, 1419 Clifton street, N.W., Washington, D.C.

Potters, National Brotherhood of Operative, J. T. Wood, Box 6, East Liverpool, Ohio.

Powder and High Explosive Workers of America, United, Ira Sharpnack, R.R. No. 3, Columbus, Kansas.

Printing Pressmen and Assistants' Union, International, J. C. Orr, Pressmen's Home, Rogersville, Tenn.

Printing Trades Association, International Allied, L. W. Hays, Newton Claypool Building, Indianapolis, Ind.

Pulp, Sulphite and Paper Mill Workers, International Brotherhood of, J. H. Malin, P.O. Drawer K, Fort Edward, N.Y.

Quarry Workers' International Union, F. W. Suitor, Scampini Building, Barrie, Vt.

Railroad Signalmen of America, Brotherhood of, D. R. Daniels, 28 Newton Street, Mansfield, Mass.

Railroad Telegraphers, Order of, L. W. Quick, Star Building, St. Louis, Mo.

Railroad Trainmen, Brotherhood of, A. E. King, American Trust Building, Cleveland, Ohio.

Railway Carmen of America, Brotherhood of, E. W. Weeks, 506-7 Hall Building, Kansas City, Mo.

Railway Clerks, Brotherhood of, R. E. Fisher, 307-310 K. C. Life Building, Kansas City, Mo.

Railway Conductors of America, Order of, C. E. Whitney, Cedar Rapids, Iowa.

Railway Employees of America, Amalgamted Association of Street and Electric, W. D. Mahon, 601-603 Hodges Building, Detroit, Mich.

Roofers, Composition, Damp and Waterproof Workers, International Brotherhood of, D. J. Ganley, 14 N. Oxford St., Brooklyn, N.Y.

Sawsmiths' National Union, F. E. Kingsley, 2728 Ashland Avenue, Indianapolis, Ind.

Seamen's Union of America, International, T. A. Hanson, 570 W. Lake Street, Chicago, Ill.

Shingle Weavers, Sawmill Workers and Woodmen, International Union of, W. H. Reid, 202 Maynard Building, Seattle, Wash.

Slate and Tile Roofers' Union, International, J. M. Gavlak, 3643 W. 47th Street, Cleveland, Ohio.

Slate Workers, American Brotherhood of, P. Jago, Pen Argyle, Pa.

Spinners' Union, International, U. Fleming, 188 Lyman Street, Holyoke, Mass.

Stage Employees, International Alliance of Theatrical, L. M. Hart, 603-7 Gaiety Theatre Building, 1547 Broadway, New York, N.Y.

Steam, Hot Water and Power Pipefitters and Helpers, International Association of, W. H. Davies, 204-205 Merrick Building, 357 W. 63rd Street, Chicago, Ill.

Steam Shovel and Dredgemen, International Brotherhood of, T. J. Dolan, 508 Fort Dearborn Building, Chicago, Ill.

Steel Plate Transferers, Association of America, The, J. T. W. Miller, 1024 Park Road, N.W., Washington, D.C.

Stereotypers' and Electrotypers' Union of North America, International, G. W. Williams, 29 Globe Building, Boston, Mass.

Stonecutters' Association of North America, International, W. W. Drayer, 332 American Central Life Building, Indianapolis, Ind.

Stove Mounters' International Union, F. Grimshaw, 1210 Jefferson Avenue E., Detroit, Mich.

Switchmen's Union of North America, M. R. Welch, 326 Brisbane Building, Buffalo, N.Y.

Tailors' Union, International Industrial, E. J. Brais, Box 597, Bloomington, Ill.

Teamsters, Chauffeurs, Stablemen and Helpers of America, International Brotherhood of, T. L. Hughes, 222 E. Michigan Street, Indianapolis, Ind.

Textile Workers of America, United, A. Hibbert, Box 742, Fall River, Mass.

Tile Layers' and Helpers' International Union, Ceramic, Mosaic and Encaustic, J. P. Reynolds, 12 Federal Street, N.S., Pittsburg, Pa.

Tin Plate Workers' Protective Association of America, International, J. Lalor, 162 14th Street, Wheeling, W. Va.

Tip Printers, International Brotherhood of, T. J. Carolan, 6 Plum Street, Newark, N.J.

Tobacco Workers' International Union, E. L. Evans, 50-53 American Bank Building, third and Main Streets, Louisville, Ky.

Travellers' Goods and Leather Novelty Workers' International Union, M. Malone, 191 Boyd Street, Oshkosh, Wis.

Typographical Union, International, J. W. Hays, 640-650 Newton Claypool Building, Indianapolis, Ind.

Upholsterers' International Union, J. N. Hatch, 234 First Avenue, Long Island City, N.Y.

Weavers Amalgamated Association of the United States, Elastic Goring, A. Haughton, 50 Cherry Street, Brockton, Mass.

Weavers' Protective Association, American Wire, E. E. Desmond, 468 Grove Street, Brooklyn, N.Y.

RECENT LEGAL DECISIONS AFFECTING LABOUR IN ONTARIO

Labour Gazette, January, 1914.

Injury to Servant—Negligence.

An action was brought by a plumber against his former employers, H. Wolfhard Company, and the owners of the Williams, Gray and Rome Building at Berlin, for damages for injuries to his left foot by falling down a temporary stairway at the factory last May. The plaintiff claimed negligence on the part of the defendants in not having a railing on the stairway, while the argument for the defence was that the owners of the building had provided a stairway, an improved means of reaching the second floor over that of a ladder. Damages to the amount of $100 were awarded.

(Franz v. Wolfhard Company.)

Death of Servant.

An action was brought by the Toronto General Trusts Corporation against the Municipal Construction Company for damages for the death of an employee who was killed in a cave-in of the walls of a ditch or sewer, at the bottom of which he was digging, working for the defendants as a labourer. The trial Judge dismissed the action. In the Supreme Court it was held that the defendants were guilty of negligence inasmuch as, according to the evidence of witnesses for the defendants, there was ample warning to the defendants that the ground was treacherous, and that they failed in their duty to take reasonable precautions for the safety of the deceased. The evidence submitted in the case showed that the deceased had since his coming to Canada, fourteen months before the accident, repaid $125.00 which was borrowed to pay the expenses of his trip, and had also sent money to his father. He had also expressed the intention of bringing his relations to Canada and of helping them after their arrival. The Court therefore held that the deceased was disposed to help his relatives and that they might reasonably have expected pecuniary benefits of a substantial character. The appeal was allowed and judgment rendered for $800 and costs, to be apportioned among members of the deceased's family.

(The Toronto General Trusts Corporation and the Municipal Construction Company.)

Negligence of Superintendent.

In the first appellate division of the Supreme Court of Ontario the following judgment was delivered by Chief Justice Sir William Meredith:—The action is brought by the widow and infant daughter of Richard Hicks, deceased, who was a workman in the employment of the appellant company, to recover damages under the

Fatal Accident Act for his death, which, as it is alleged, was caused by the negligence of the appellant company. The facts are fully stated in the reasons for judgment of the learned Trial Judge, and it is unnecessary to re-state them. His finding was that there was in use by the appellant company "a defective system which caused the death of Hicks," and he held that the respondents were entitled to recover at common law, and he assessed the damages at $4,000. He also assessed them contingently at $2,000 if ultimately it should be held that the respondents were entitled to recover only under the Workmen's Compensation for Injuries Act. The right of the respondents to recover under the Act was but faintly denied; but it was contended that they were not entitled to recover at common law. I should not have differed from the conclusion of the learned Trial Judge that the appellant company was liable at common law if the place in which the deceased was working at the time he met with the injury which caused his death had been a place in which, in the ordinary course of the business of the company, workmen would be required to be employed; for in that case the company would have failed to perform the duty which it owed to its workmen. (*Anslie Mining and Railway Company v. McDougall* (1909), 42 *S.C.R.* 420; *Brooks v. Fakkema* (1911), 44 *S.C.R.* 412.) No such case was made by the respondents. The place in which the deceased was working was not ordinarily used or intended for workmen to work in. It was a passageway, seldom used; and the occasion of the deceased being at work there was a very exceptional one, due to the necessity of moving through the passageway the large pulley which was to be placed in the engine room. The duty of guarding against the risk to which the deceased was exposed in moving the pulley was therefore, I think, not one which the appellant company might not delegate to a competent superintendent or foreman. Besides this, the projecting end of the shaft was not a source of danger to anyone unless the shaft was in motion; and in the usual course of the business it was not in use during the day time. On the morning of the accident, owing to something having occurred which necessitated the repair of a belt in connection with the shaft, which was ordinarily used for the purpose of supplying power to the customers of the appellant company, it could not be used, and the other shaft was being temporarily used instead of it. There was, therefore, the conjunction of two exceptional circumstances which led to the deceased being at work at a place in which he was exposed to unnecessary risk of injury. For these reasons I am of opinion that the efficient cause of the deceased's injury was not the failure of the appellant company to perform the duty which rested upon it, to which I have referred, but the negligence of the superintendent who had charge of the moving of the pulley, in requiring him to work at a place where, owing to the shaft with the projecting end being in motion, he was in a position which needlessly exposed him to risk of injury. The judgment should, in my opinion, be varied by reducing the damages to $2,000, and with that variation it should be affirmed. There should be no costs of appeal to either party.

(Hicks v. Smith's Falls Electric Power Company.)

Injury to Workmen.

Actions for damages for personal injuries sustained by two plaintiffs in the employ of the R. S. Blome Company through the alleged negligence of the Company were tried at Hamilton on November 1 and 6. The defendants were contractors for a large brick and concrete building, and to facilitate its erection a hoist was raised outside the main wall for the purpose of conveying material to the

different stories as they were erected. The material was put through holes in the wall at different heights, and after the completion of the outside wall it was necessary to fill up these holes. The plaintiffs to carry out this work found it necessary to get on to the hoist, which was not intended for passenger use, but which provided the best means of carrying out the work in question. When the men were on the hoist it suddenly fell and they both fell to the ground, each sustaining a broken back. The Court held that the accident was due to negligence of the foreman in having the hoist used for other purposes while the men were engaged on the temporary work, although the negligence did not constitute liability as common law. Under the Building Trades Protection Act, however, the Company was liable by reason of the operation of a hoist which did not afford reasonable safety from accidents to persons engaged on the building. Mr. Justice Middleton, in delivering the judgment of the Court, awarded one of the defendants (Schofield) $3,500, and the other (Johnston) $2,500, stating that if there were any liability under the Workmen's Compensation Act the amounts must be reduced to $2,700 and $1,500 respectively.

(Schofield v. Blome Company; Johnston v. Blome Company.)

Workmen's Compensation.

At Welland, on December 9, Henry Farrar, of Port Colborne, was awarded $1,500 damages against the Maple Leaf Milling Company for injuries sustained while in the employ of that Company during March. Plaintiff was directed to go to the seventh floor, and was there assisting to throw in the gear of the elevator. While doing this a heavy iron attachment fell on him, breaking his leg in two places. Evidence was given to show that there was a flaw in the machinery, and that the Company had been informed as to this. The jury found that the defect in the machinery was the cause of the accident, and that the defendant Company was negligent in not repairing this defect when notified of its existence. It was held that there was no contributory negligence on the part of the plaintiff, and that he was properly in the discharge of his duty at the time of the accident.

(Farrar vs. Maple Leaf Milling Company.)

Labour Gazette, February, 1914.

Negligence.

In an action to recover damages under Lord Campbell's Act at Hamilton, on October 27, 1913, the following judgment was rendered by the Honourable Mr. Justice Middleton: The deceased was a brakeman employed upon the railway. A train was being made up in the railway yard. The deceased improperly went between the cars when in motion for the purpose of uncoupling them. At the moment when he was between the cars they came in contact with cars already standing upon the track. As the result he was crushed by logs projecting over the end of one of the cars and instantly killed. The jury have found that although the logs were properly loaded in the first place, the railway was negligent in not discovering earlier that the logs were in a dangerous position. Upon these facts I think the plaintiff fails. The accident causing his death was the direct result of the plaintiff's misconduct in going between the cars while in motion.

(Cook v. Grand Trunk Railway Company.)

Contributory Negligence.

An action was brought by a workman employed by the Canada Cement Company, Limited, at Belleville, to recover damages for injuries sustained by him by reason of an air-drill, which was being moved, falling on him. It appears that the plaintiff sat down by the fire with his back to the air-drill when fellow workmen were either moving it or had just stopped, and that the machine fell over on him. The Court held that it was a case of contributory negligence and dismissed the action with costs.

(Phillips vs. Canada Cement Company, Limited.)

Master and Servant.

An action was brought by Mrs. Pressick for damages because of the death of her husband, who was killed by falling down a shaft in a gold mine while working for the Cordova Mines Company. The deceased and one James Steinberg were, by orders of the defendant company's foreman, working on a drill in a horizontal drift, or tunnel, about 200 feet below the drift, or tunnel, and an open vertical shaft or tunnel, in size about twelve feet by eighteen feet, connected the two tunnels. It was the duty of the deceased and his helper Steinberg to work a drill near the edge of this shaft, drilling across the floor roof of the tunnel a row of holes which were to be charged with dynamite and exploded, whereby a section of rock would be separated from the mass, and caused to fall down the shaft. To accomplish this end the drilling had to be done reasonably close to the edge of the shaft, which ran almost across the tunnel. The drilling machine consisted of a tripod having a drill, or steel, in the centre. To operate it properly the tripod required to be so placed that two of the legs were within twelve or fourteen inches of the edge of the shaft. This would enable the steel to drill a row of holes across the floor of the tunnel about two and a half feet away from the opening. On the top of the machine was a nut which, at times, in the course of the operation of the machine, required to be tightened or loosened by a wrench supplied for such purpose by the defendant Company. On the night of the accident, the deceased, along with Steinberg, set up the machine close to one of the hanging walls of the tunnel, with two of the legs placed within twelve or fourteen inches of the open shaft, one of these two being near the hanging wall of the tunnel in order to permit drilling as close as possible to the sides of the tunnel. Just before the accident the helper, Steinberg, saw the deceased pick up the wrench and put it on the nut, saying he was going to loosen it. Steinberg then leant over to remove the drill, and, hearing the wrench slip, looked up, when he saw the deceased fall over the edge into the shaft and disappear, falling about 100 feet, and sustaining fatal injuries. The following were the questions submitted to the jury with their answers: (1) Was the death of the plaintiff's husband caused by any negligence on the part of the defendants? A. Yes. (2) If so, in what did such negligence consist? A. The opening through which the man Pressick fell should have been guarded, or protected, in some manner. (3) Was the accident caused by any defect in the works, ways, machinery, plant or premises of the defendants? A. Yes. (4) If so, what was such defect? A. That wrench used was defective, also the opening being unguarded or unprotected. (5) Was the opening through which Pressick fell dangerous by reason of its depth? A. Yes. (6) Was it practicable to cover or guard that opening, having regard to the work of breaking down the pillar of ore

on which Pressick was engaged at the time of the accident? A. Yes. (7) Could Pressick, had he exercised reasonable care and diligence, have avoided the accident? A. Yes. (8) If so, in what did such negligence consist? A. Should have used more care in using a defective wrench. (9) What damages have the plaintiff and her children sustained by reason of the accident? A. $1,750. The Honourable Justice Latchford refused to accept the verdict of contributory negligence and entered judgment for the plaintiff for $1,750 damages and costs. In the second appellate division of the Supreme Court of Ontario an appeal was entered, the case being held on November 10th, 1913. In this case two of the Judges were in favour of the appeal and two upheld the appeal. It was therefore dismissed with costs.

(Pressick v. Cordova Mines, Ltd.)

Negligence.

An action was brought under Lord Campbell's Act by the administrator of Walter Dynski to recover damages for his death on the 14th of February, 1913, while engaged in removing ice from the rails of a spur line on the premises of the Steel Company of Canada at Hamilton. The line in question was a curved line, belonging to the Grand Trunk Railway Company, used for the purpose of bringing cars up on the steel plant to a convenient position for loading and unloading. A gang plank was placed across the track at the height of two or three feet from the rails for the purpose of enabling cinders, scrap, etc., to be conveniently moved by men with wheelbarrows. The deceased was engaged as a foreman supervising a gang of men in the clearing of the tracks of ice which had formed upon them. At the time of the accident notice had been given to the railway men to remove the cars on either side of the gang plank. The deceased foreman was on the ground between the gang plank and the end of a car when the engine moved the cars, with the result that he was crushed between them and instantly killed. The Court held that the employees of the railway in charge of the engine were negligent in not themselves seeing that there were no men in a position of danger before actually moving the cars. They were not, in the view of the Court, justified in relying upon the statement of the yard foreman that the plank would be removed when the cars were ready. Damages were fixed at $2,500, apportioned equally between the widow and the infant child of the deceased. The Court held further that there was no liability on the part of the Steel Company.

(Mercantile Trust v. Steel Company of Canada, Limited, and Grand Trunk Railway Company.)

Death of Servant.

An action was brought by his widow to recover damages for the death of Louis McNally, a former employee of the Halton Brick Company. The deceased was a labourer employed in the brickyard of the defendants. His death resulted from a pile of bricks falling on and crushing him. The plaintiff's contention was that the bricks fell on the deceased because of the defective construction of the floor on which they were piled. The case was tried before Judge Kelly and a jury at Brampton at the last Fall Assizes and judgment was reserved. The defendants' contention was that they were not to blame and were not liable at all, but that if they were liable, the plaintiff, if entitled to anything, was so entitled under the Work-

men's Compensation Act, which would limit the damages to $1,500. The plaintiff's contention was that she was entitled to recover the full amount of damages fixed by the jury because the defendants were liable at common law as well as under the Act. Judge Kelly on January 8th gave judgment in favour of the plaintiff for the full sum of $3,000 and costs.

(McNally v. Halton Brick Company.)

Labour Gazette, March, 1914.

Action for Damages Dismissed.

The Honourable Mr. Justice Kelly recently dismissed an action brought for the death of a superintendent in the employ of the John Mann Brick Company, Limited, who was smothered to death in a mixing hopper of the defendants, holding that no defect in the plant or system had been shown, and that in any case deceased was responsible for the sufficiency of the same. The facts of the case were as follows: William Frederick Lang was in the employ of the defendants at their brick manufacturing plant, and on April 1st, 1913, met his death in the large hopper in which lime and sand were placed and from the bottom of which these materials passed to the machine by which bricks were made. On the outside of the hopper was a ladder leading up to a platform near its top, around which was a railing; inside the hopper was a ladder leading downwards from its top. The sand and lime in the hopper had a tendency to clog, which necessitated at times an operation to start again the flow towards the opening at the bottom. On the afternoon of the day in question, Lang was found dead in the lower part of the hopper, the sand and lime having run in upon him and smothered him. Negligence was alleged on the part of the defendants. The evidence on which the claim was based showed that deceased had been in the employ of the company for about two years, and that he had charge of the men in the plant, and that he was manager of the repairs, and that alterations had been recently made to the hopper under his direction. An iron rod was provided for starting the sand and lime running when they became clogged, and a covering for the mouth and nose was kept in the office under charge of the deceased for the use of those having occasion to enter the hopper, and which would have protected him had he used it. Other evidence submitted for the plaintiff showed that the sand and lime were running satisfactorily on that day and that there was no necessity for deceased entering the hopper. Mr. Justice Kelly in disposing of the case held that there was no evidence that the defendant Company committed a breach of common law duty towards the deceased, especially when the position that he occupied in the conduct of the business was kept in mind. It was also held that there was equally an absence of evidence necessary to render defendants liable under the Workmen's Compensation Act. In spite of the fact that the jury found negligence on the part of the defendants and assessed damages at $1,000, the Judge dismissed the action.

(Lang v. John Mann Brick Company, Limited.)

Negligence of Foreman.

In the Second Appellate Division of the Supreme Court of Ontario, an appeal was heard from the ruling of the senior Judge of the County Court of the County of Wentworth in favour of defendants in an action for damages for injury. The plaintiff, Lear, was in the employ of the Canadian Westinghouse Company, and

sustained injuries while working for the defendants in their factory in attempting to hold up a heavy plate. Plaintiff alleged negligence on the part of the defendants, and the Lower Court dismissed the action. Judgment was rendered in the Higher Court by the Honourable Sir John Boyd, as follows: The plaintiff cannot recover at common law. There was no defect in the works, or appliances; a crane was provided for the hoisting up of large plates; the smaller ones were handled by men called in for the occasion from other work. It was left to the discretion of the foreman as to how many men should be employed in lifting the smaller plates, and if he erred in judgment or was negligent in putting on the men too heavy a load it was the fault of the foreman, who was no more than a fellow servant, and so (as before the Workmen's Compensation Act) the master was not liable. The judgment should be affirmed. No costs.

(Lear v. Canadian Westinghouse Company.)

Contributory Negligence.

At London, on January 20th, the Honourable Sir Glenholme Falconbridge dismissed an action brought by a workman against his employer for damages sustained by reason of the operation of a circular saw. The case was tried before a jury, and questions were asked and answered as follows: (1) Were the injuries which the plaintiff sustained caused by any negligence of the defendants? Yes. (2) If so, wherein did such negligence consist? In not having the machine properly guarded. (3) Was the machine a dangerous machine so that it ought to have been, as far as practicable, securely guarded? Yes. (4) If you answer "Yes" to the last question, was it, as far as practicable, securely guarded? No. (5) Was the plaintiff guilty of negligence which caused the accident, or so contributed to it that but for his negligence the accident would not have happened? Yes. (6) If you answer "Yes" to the last question, in what did his negligence consist? In not seeing that the machine was properly guarded. (7) Or, was the casualty which resulted in the plaintiff's injuries a mere accident for which no one is responsible? No. (8) At what sum do you assess the amount of compensation to be awarded to the plaintiff in case he should be held entitled to recover? The sum of $85. The Court held that the answer to the sixth question amounted to a finding that there was an appliance at hand which the plaintiff could have used for a guard had he been so inclined. Failing to do this involved an act of contributory negligence, and the action was dismissed with costs.

(Livermore v. Gerry.)

Common Law Liability.

An action for damages for injury sustained by one Kostenko, while in the employ of the defendants, through their alleged negligence, was tried at Port Arthur on December 15th. The deceased was carrying logs on the premises of the defendants, and the work was situated that the trees were being felled so close that they fell across the paths along which the logs were being carried. A claim was made under the Workmen's Compensation Act, but it was admitted at the trial that as no notice of the injury had been given within the time limited by the Act, and that the action itself had been commenced too late, the plaintiff could have no remedy thereunder. The Honourable Mr. Justice Sutherland reserved judgment, however, and awarded $900 damages later, holding that the defendants were following a negligent system.

(Kostenko v. O'Brien.)

Negligence.

That contributory negligence is a defence to an action for negligence, even where the accident was occasioned by the neglect of the employer to perform a statutory duty, was the finding by Mr. Justice Britton in an action for damages at Port Arthur recently. The plaintiff in the case was the widow of a machine oiler, who was killed while in the employ of the Canadian Northern Coal and Ore Dock Company, through the alleged negligence of the defendants, the case being heard by a jury. Questions were submitted to the jury, and the answers to all of these with one exception were such as to fix liability upon the defendants. This was a statement to the effect that the deceased was guilty of contributory negligence, that is to say, that by the exercise of reasonable care he would have avoided the accident. The jury added that in their opinion the accident was due to the joint negligence of the defendants and the deceased, and assessed the damages which the plaintiff was entitled to recover at $1,200. Mr. Justice Britton held that the jury found that there was failure by the employers to perform a statutory duty, but in view of the fact that the deceased was guilty of contributory negligence the action was dismissed.

(Linazuk v. Canadian Northern Coal and Ore Dock Company.)

Common Law Liability.

An action was brought by the widow of the late John Paskwan, who was killed at the power house of the Toronto Power Company, on February 8th, 1913, to recover damages at common law, and, in the alternative, under the Workmen's Compensation Act, for his death. The deceased man was employed as a rigger at the Power Company's works at Niagara Falls. He was working under a cable, on which was a travelling crane, from which were suspended two hooks. These were hoisted by steel cables wound upon drums. On the day of the accident the larger hook was going to be used and the smaller one was hoisted so as to get it out of the way. The man in charge of the hoisting apparatus neglected to stop the winding up of the cable raising the smaller hook, with the result that it was carried up to the drum, and being unable to pass through, such a strain was placed upon the cable that it broke and the hook fell, killing Paskwan instantly. The jury found, in addition to negligence on the part of the men in charge of the crane, negligence on the part of the Company, as the master mechanic had failed to install proper safety appliances. Damages were assessed under the Workmen's Compensation Act at $3,000, and at common law for $6,000. Judgment for the latter amount was rendered by Mr. Justice Kelly. An appeal by the defendants was heard in the Second Appellate Division of the Supreme Court of Ontario on February 5th. Mr. Justice Middleton held that it would have been simple to have a device which would automatically bring the machinery to rest. The fact that such devices had been successfully installed and were in use upon similar hoists in similar buildings showed that the case could not have been taken from the jury, and the appeal was accordingly dismissed.

(Paskwan v. Toronto Power Company.)

Labour Gazette, April, 1914.

INJURY TO SERVANT.

Several actions for damages for injuries were brought at the Spring Assizes at Welland. Thomas V. French entered an action for damages against the Canada Cement Company for the loss of his right leg while in their employ. Plaintiff was awarded $2,100 and costs.

LOSS OF EYE.

Antonio Potenza received $3,000 and costs for damages for the loss of his eye while in the employ of the Canadian Ramapo Iron Works.

FATAL ACCIDENT.

A suit against the Clifton Sand, Gravel and Construction Company for $3,000 damages for the death of Jacob Popeu as a result of injuries received while employed in defendants' gravel pit, was settled out of court, defendants paying $1,500 and costs.

NO NEGLIGENCE.

The action of Gabor Poezak against I. Y. Harper, sewer contractor, for $1,000 damages for injuries received, was dismissed with costs, the jury finding no undue negligence on the part of the defendant. The accident happened in Welland on October 9th last, when a sewer trench caved in, breaking plaintiff's leg.

MASTER AND SERVANT.

A workman who had the fingers and thumb of one hand cut off by the knives of a jointer in the Tudhope-Anderson factory in January, 1913, entered suit against the Company for $5,000 damages. The case was tried before Chancellor Boyd at Barrie. The jury brought in a verdict for $3,000—$1,000 under the Compensation Act and $2,000 at Common Law. They, however, gave negative answer to a question where an affirmative would have been more consistent with their verdict, and while they were out considering the point the parties agreed on a settlement on the basis of the $1,000 awarded under the Compensation Act, it being doubtful whether the remaining $2,000 would be sustained on appeal.

(Chadwick v. Tudhope-Anderson Company.)

Labour Gazette, May, 1914.

DEATH OF SERVANT.

An action was brought by Mrs. Frank Marlatt against P. H. Secord & Sons for damages for the death of her husband while working for the defendant Company on the Brantford Post Office. In reply to a question by the jury as to whether or not the verdict should be rendered in the Common Law or under the Workmen's Compensation Act, Mr. Justice Kelly replied that they were to find under both Law and Act, informing them that the limit under the Workmen's Compensation

Act was three years' wages at the rate earned at the time of death. The jury brought in a decision giving the limit allowable under the Workmen's Compensation Act or $5,000, according to Common Law. Mr. Justice Kelley decided that in this case the Common Law was operative and gave judgment for $5,000 and costs, the award to be apportioned as the jury directed.

(Marlatt v. P. H. Secord & Sons.)

Fatal Accident.

An action was brought against the Foundation Company, Limited, for damages for the death of a workman who was killed while working on the foundation for the Customs Building at Ottawa. The deceased man was employed as a labourer on one of the caisons which was being constructed in connection with the digging of the foundation. His work was to hitch and unhitch a rope which was fastened to a bucket, and for this reason he was stationed on a platform about twenty feet above the ground. It was alleged that owing to some fault in the machinery, or to carelessness on the part of other workmen, a portion of the woodwork near where the deceased man was working was thrown from the platform, carrying him along with it, and causing him to fall to the ground, which resulted in his death. The jury found that the Company was guilty of negligence, and Mr. Justice Lennox awarded $1,800 damages in accordance with the provisions of the Workmen's Compensation Act.

(Ouimet v. Foundation Company, Limited.)

Employees Guilty of Negligence.

By section 15 of the Workmen's Compensation Act it is provided that in an action brought under that Act, if a plaintiff claims that his injury was received by reason of the negligence by any person in the service of the defendant, the particulars shall give the name and description of such person. The defendants in an action for damages claimed that this gave them the statutory right to have the name of every employee against whom negligence was to be charged, and that the Court had no discretion in the matter. The evidence submitted in the case showed that at St. Catharines, where the accident occurred, the station-house is so situated as to prevent any extended view along the tracks. A train had been given through orders, not calling for any stop at St. Catharines. For some time before it reached the station a way-freight train had been shunted upon the sidings, the switch had been left open from the main track, and the distant semaphore had not been set to warn any train running on the main track, nor had there been any man stationed to flag an approaching train. By reason of this the on-coming train ran into the siding and the engineer was killed. His infant children sued the company, alleging negligence. The railway sought to impose upon the plaintiffs the obligation of fixing the blame upon some particular individual, and of pointing out the specific rules of the company, which had been disobeyed by its servants, as a condition of being allowed to prosecute the action. The Court held that the law placed no such obligation upon a plaintiff, and that the above mentioned section, if it had any application, applies only where the claim of the plaintiff is based upon some specific act of misconduct on the part of a fellow-servant.

(Pierce vs. Grand Trunk Railway.)

Employment Agents.

Three men who conduct an employment bureau at Hamilton were arrested on a charge of committing a breach of the immigration regulations by failing to keep their license posted where it could be readily seen, and also for not keeping a complete record of the people with whom they did business. It was also found that they had been doing business with people with whom they had no right to negotiate under the terms of their license, and a fine of $50 was imposed. One of the defendants was further charged with fraud, four different people claiming that he had been obtaining money from them under the promise that he would secure employment. Two of these he sent to Hamilton, but when they arrived they were unable to find work. The fraud cases were held pending restitution by the defendant.

(Crown v. Webb, Russ and Stewart.)

Another employment agent was fined at North Bay for violating the immigration regulations. The defendant hired some Spaniards for construction work on the Canadian Northern Railway, the men signing a document that they had been in Canada over three years, and being assessed $2 each as an employment fee, whereas regulations provided that the maximum charge shall not exceed one dollar.

(Crown vs. Barker.)

Death of Servant—Damages.

Three thousand dollars damages were awarded by Mr. Justice Britton, at Osgoode Hall, to Mrs. Emma Moffatt, of Sarnia, widow of a Grand Trunk Railway Conductor, who was killed while on duty owing to a collision between two freight trains near Kingscourt Junction in November last. The deceased was in the conductor's van of his train, which was stalled in consequence of the main line being blocked, when another freight train crashed into it from the rear. The widow of the deceased sued the Company for $10,000 damages, obtaining $3,000, as stated.

(Moffatt vs. Grand Trunk Railway.)

Labour Gazette, June, 1914.

Dock Labourer Casually Employed.

In an action by the representatives of a dock labourer, employed from time to time by the Canadian Pacific Railway Company at Windsor, who fell from the Company's docks and was drowned, it was held that there was no evidence of employment or of negligence, and the action was dismissed. The deceased was a dock labourer employed from time to time by the Canadian Pacific Railway to assist in unloading freight from vessels calling at the docks at Windsor and in loading freight upon cars. When work was required to be done any labourers applying were employed and paid by the hour. The deceased worked at the dock for some years and was recognized as an efficient and faithful labourer. For some time he had suffered from epileptic fits, which, however, in no way impaired his general usefulness, and notwithstanding this malady, he was employed at the docks, those responsible seeing that he was given work in the sheds and away from the danger of falling into the water. The railway officials finally became alarmed at the re-

currence of the fits, which would sometimes happen as often as four or five times a day, and determined to cease employing him. The man thus found himself without any means of maintenance, and finally the railway officials agreed to allow him to work upon his executing a release of all liability in respect to injury which might befall him. The deceased, who had been unloading flour at the docks the day before the accident occurred, returned to work the morning of the accident, with the view of assisting in the loading of a quantity of flour unfinished from the day before. He was met by the foreman, who told him all the men necessary had already been employed, nevertheless he went towards the office along the front of the docks outside the sheds. This dock consisted of a narrow walk eight feet in width, with gangways opposite the different doors. These gangways sloped from the doors to the edge of the water, the slope being one foot in eight. Just before the deceased reached one of the gangways he staggered, fell forward upon the sloping gangway, and rolled into the water. Two or three men at once dived to rescue him, but he never rose. The Court held that there was no evidence to show that at the time of the accident the man was an employee, that it was evident that the man had taken a fit, and that no negligence on the part of the Company had been shown. The action was accordingly dismissed.

(Beckerton vs. Canadian Pacific Railway Company.)

Injury to Workman—Contributory Negligence—Damages Awarded on Appeal.

In the February, 1914, issue of the *Labour Gazette* an account was given of an action brought by a workman in the employ of the Canada Cement Company, Limited, at Belleville, to recover damages for injuries sustained by the fall of an air drill. At the original trial the Court held that the accident was caused by the contributory negligence of the workman injured, although the findings of the jury negatived contributory negligence on the part of the plaintiff and found the foreman in charge guilty of negligence. The case was appealed to the Supreme Court of Ontario, and the unanimous opinion of that Court in a judgment delivered by Honourable Sir William Meredith was that judgment should have been entered for the plaintiff at the original trial on the findings of the jury. The appeal was accordingly allowed, the judgment of the trial judge being reversed and judgment given for the appellant with costs.

(Phillips v. Canada Cement Company, Limited.)

Labour Gazette, July, 1914.

No Liability at Common Law.

In the February, 1914, issue of the *Labour Gazette*, a summary was given of a case brought by a yardman in the employ of the Canadian Pacific Railway Company for personal injuries caused by being run down by a shunting car while engaged in such employ. The plaintiff was barred by lapse of time from an action under the Workmen's Compensation Act, and the action was brought at common law. The plaintiff claimed that the cars were shunted along the tracks where he was working without any warning to him of their approach, and that this failure was a "defect in the ways, works, machinery, plant, or in the condition or arrangement thereof, and was negligence," which entitled him to recover. The defendants

maintained that the man in charge of the shunting gave ample warning by word of mouth to the man on the track. Accepting the finding of the jury, who were of the opinion that the warning had not been actually given, the trial judge held there was no Common Law liability, and held the defendants were not liable at Common Law as the system of operation of the railway was entirely satisfactory. It was held that the work was subsidiary to the operation of the road, and that if there was a failure to discharge any duties it was the negligence of a fellow-servant and therefore did not constitute a Common Law liability. The plaintiff appealed from the above decision to the Second Appellate Division of the Supreme Court of Ontario, and was granted a new trial, with leave to amend pleadings.

(Kreuszynicki vs. Canadian Pacific Railway Company.)

Labour Gazette, August, 1914.

Dangerous Appliances.

In an action to recover damages for injuries sustained by a woodworker in the course of his employment in the defendant's factory, it was shown that the plaintiff was not a skilled factory hand, having but a short time previously been employed as an outside labourer, and therefore had no proper appreciation of the risk he was incurring in operating a jointer provided, according to the jury's finding, with a defective guard. Mr. Justice Latchford held "that it is negligence for which a master is liable at Common Law if he knows or ought to know that the machinery used by the persons employed by him is improper or unsafe, and notwithstanding that knowledge, sanctions its use," and directed that judgment be entered for the plaintiff for $2,000 damages and costs.

(Chadwick v. Tudhope.)

Deceased Author of Accident.

An action tried before Mr. Justice Middleton under the Fatal Accidents' Act to recover damages for the death of a workman employed by the Pere Marquette Railway Company, due to the alleged negligence of the defendant company, was dismissed, the judge holding that the workman had been negligent. The deceased was foreman of the coal sheds of the company at Blenheim, where coal was hoisted into bins at a considerable height by means of an engine operated by natural gas. Gasoline had sometimes to be used to start the engine, and a quantity was kept for this purpose. On the night on which the accident occurred, the deceased went into the storage shed for gasoline, taking a lantern with him. In pouring gasoline from a large can into a smaller vessel, some was splashed upon the lantern. In the explosion that followed, Martin was so badly burned that he died and the entire coal sheds were destroyed. Mr. Justice Middleton held that "a workman who attempted to pour gasoline from a can into a beer bottle through a funnel within two or three feet of a lighted lantern, thereby causing an explosion, was the author of his own misfortune, and that the findings of the jury that defendants were negligent in not supplying proper appliances must be disregarded," and thereupon dismissed the action.

(Martin vs. Pere Marquette Railway Company.)

CONTRIBUTORY NEGLIGENCE.

Two cases resulting from the same happening were tried together at London, the evidence for the two being the same. In the first, the City of London claimed damages for destruction of a motor fire engine and truck, which, in responding to a call which necessitated crossing the railway tracks of the defendant company, was struck by a train and rendered worthless. The plaintiffs claimed that the train was running at an excessive rate of speed, that the bell of the locomotive was not rung nor the engine whistle sounded, and that there was not sufficient light upon the locomotive. Evidence, however, was given which found that contributory negligence was shown, and the action was dismissed with costs.

(London vs. Grand Trunk Railway Company.)

In the second, the plaintiff, a fireman upon the fire truck referred to in the foregoing judgment, was thrown in the collision beneath the truck and sustained serious injuries. The finding of the jury in respect of the negligence of the company was the same as in the former case, but they also found that the plaintiff of this case could not by the exercise of reasonable care have avoided the accident. Judgment was thereupon rendered in his favour for $600 and costs.

(Summers vs. Grand Trunk Railway Company.)

Labour Gazette, September, 1914.

FATAL ACCIDENT.

In an action tried before the Honourable Mr. Justice Kelly and a jury at London, Ont., brought by the widow of a teamster, who had been killed through being crushed against an archway over an alley, it was held that no evidence of negligence on the part of the defendant had been shown which could properly be submitted to a jury, and the action was dismissed. The plaintiff appealed to the Supreme Court of Ontario, Second Appellate Division. The contention of the widow, who brought the action and claimed damages on account of the negligence of defendants, was that such negligence consisted in the fact that the archway was not of sufficient height and width, and it was further contended that the act of the defendant in erecting and maintaining the archway at irregular heights was also negligence. The finding of the appeal court sustained the judgment of the trial judge, it being held that the accident occurred in broad daylight, that everything was open to the view of a careful man, and that there was no negligence on the part of the defendants.

(Parker vs. Dyment Baker Lumber Company.)

Labour Gazette, October, 1914.

INJURY TO SERVANT—NEGLIGENCE.

An action was brought by a brakeman in the employ of the Grand Trunk Railway Company for injuries received while in the Company's employ. The brakeman when not actually at work spent his time in the cab with the engineer and the fireman. At the time of the accident he had stepped to the gangway between the cab and the coal tender for the purpose of looking for signals, etc., and on stepping backwards from having done this he was struck or came in contact with a long poker then in use by the fireman in the performance of his duties. The plaintiff was thrown from the train, receiving such injuries as

necessitated the amputation of his left leg four inches below the knee. The jury's only finding of negligence was that the accident had been caused by the lack of care by the fireman in handling the poker while the plaintiff was in the performance of his duties. Mr. Justice Kelly found that the negligence of the fireman was not negligence of the defendants, and so dismissed the action with costs.

(McIntyre v. Grand Trunk Railway Company, Limited.)

Injury to and Death of Servant.

An action was brought by the parents of a maid, who when living was the head waitress in the defendant's hotel, and who was killed by an explosion of the range, or hot water attachments thereto, in the kitchen of the hotel where she was employed. Negligence was claimed on the ground that the range was so negligently and carelessly set up as to cause the explosion. The plaintiffs further allege that it was the duty of the company to see that the maid was provided with a safe place to work in, and that in this regard the defendants had failed to perform their duty. Mr. Justice Britton, however, found that the company had appointed a competent manager, who in turn had selected a man in the business of steam and hot water heating to do what seemed to the manager an ordinary job. There was no evidence of any carelessness in the matter, and, therefore, the judge dismissed the action without costs.

(Junor v. International Hotel Company, Limited.)

Death of Servant—Negligence.

An action was brought by the widow of a workman engaged in a lumber yard who was killed as a result of lumber falling upon him, owing, as the plaintiff alleged, to the negligence of the defendants. From the evidence it appeared plain that the accident was due to negligence on the part of the deceased and not of the defendants. The deceased had been warned from time to time as to the danger of the work upon which he was engaged, and had on the day of his death successfully let down three piles of lumber and apparently understood just how to do it. Mr. Justice Lennox held that the employers were not liable, since the cause of the accident was the negligence of the deceased, and the action was accordingly dismissed without costs.

(Sodem vs. Tomiko Mills.)

Labour Gazette, December, 1914.

Negligence—Death of Workman.

Judge Latchford gave judgment recently regarding the death of a workman, who, for two and one-half years, had been a labourer on the city pay roll, and who, on May 9, 1914, was placing pipes in a sewer on one of the avenues, which he had helped to dig, when the tunnel collapsed and buried him beneath a large mass of sand and earth. Action had been brought by the widow of the deceased on behalf of herself and her three children. They asked for damages to amount to $5,000. The judge held that the death of the deceased was caused by negligence on the part of the City of Toronto, and that the negligence consisted in lack of proper supervision. On this ground the judge awarded the widow $1,000 and the children $1,500. (*Iacona v. City of Toronto.*)

LABOUR DISPUTES IN ONTARIO

Labour Gazette, February, 1914.

Strike of Silver Miners at Cobalt.

Only one strike was reported to the Department as having occurred during January, silver miners at Cobalt ceasing work because, as they claimed, the company was not observing the eight-hour day which recently went into effect in the mines of Ontario. In this case an adjustment was soon effected and the men resumed work.

Labour Gazette, March, 1914.

Strike of Core Makers at Brantford.

Coremakers in the employ of the Massey-Harris Company went on strike at Brantford on February 17th, twenty-five journeymen and ten helpers being involved. The cause of the dispute was the re-adjustment of the wage scale as the result of new working conditions in the foundry. The men were asked to accept the same conditions as were in force at Toronto, where the best men were making $3.50 to $4.00 a day of ten hours. After being out two days the men accepted prices slightly higher than this, with a reduction, however, from the prices previously in effect.

Labour Gazette, April, 1914.

Strike of Rivetters and Car Makers at Hamilton.

Fifteen rivetters in the employ of the National Steel Car Company at Hamilton struck work on March 25th, on account of the decision of the Company to make a reduction in piece-work wages. According to the statement of the company, a certain contract was undertaken at a close figure, the men being notified that a reduction in wages would be necessary on that particular work only. A day or two later, about sixty-five car makers in the employ of the same company struck work, refusing to accept the reduction. An officer of the Department of Labour brought the parties together with a view to effecting a settlement of the dispute, but no agreement had been reached at the end of the month.

Strike of Garment Workers at Toronto.

A strike of garment workers at Toronto occurred on March 16th, and was still in existence at the end of the month.

Strike of Harness Makers at Gananoque.

A lock-out of harness makers in the employ of the W. J. Gibson Company and the Gananoque Harness Works occurred at Gananoque on March 2nd. No demands were made by the employees concerned, the cause of the dispute being the recent formation by the employees of an organization. A fair wage officer of the Department of Labour visited the scene of the dispute and succeeded in bringing the parties together with a view to arranging an adjustment of the difference. The employers offered to take back some of the men, but it is understood that as a result of slack conditions in the trade the full number of hands is not required. About thirty employees were involved in this dispute.

Labour Gazette, May, 1914.

Strike of Painters at St. Thomas.

About ten painters, in the employ of two firms, struck work at St. Thomas on April 6th, demanding an increase in wages from twenty-five to thirty cents an hour. After being out for about two days the strikers returned to work at an increase of two and one-half cents an hour, which was the amount offered by the employers before the men ceased work.

Strike of Marble Setters at Toronto.

A strike involving thirty marble setters occurred at Toronto on April 9th. The dispute was the result of a disagreement between the Bricklayers' and Masons' Union and the Marble and Tile Setters' Union, as to whether members of the former union had the right to do the work that the marble and tile setters claimed should be done by them.

Strike of Sheet Metal Workers at Toronto.

On April 21st about ninety sheet metal workers in the employ of the A. B. Ormsby Company, Limited, of Toronto, struck work the cause of the dispute being the employment by the company of a non-unionist. The company claimed that the employees were violating the agreement in asking for the removal of the employee in question, the clause in reference to this matter stating that union sheet metal workers would not be asked to work with non-unionists, except when the union could not supply competent workmen. It was claimed that in the present case the union was unable to replace the employee objected to. The majority of the strikers were members of the union, but the strike was not called by the union. After being out two days the men returned to work unconditionally.

Strike of Garment Workers at Toronto.

About thirty garment workers, in the employ of the C. H. Evans Tailoring Company, struck work at Toronto on April 28th. It was claimed by the employers that the dispute was the result of the refusal of the company to allow conferences in the shop between the representatives of the unions concerned and the members. The strikers, however, claim that the strike was caused by the company holding back wages that were due to them.

Labour Gazette, June, 1914.

Strike of Moulders at Smith's Falls.

Moulders and coremakers to the number of about 150, in the employ of the Smith's Falls Malleable Casting Company, struck work on the first of the month against a reduction of fifteen per cent. on piece work and of twenty-five cents a day on day work for moulders and of fifty cents a day on day work for coremakers.

Strike of Cloak Makers at Toronto.

Forty-five employees of the Exclusive Cloak Company of Toronto, quit work on May 11th for the same reason which caused a strike of garment workers in March last at the Dominion Cloak Company, namely, objection to the introduction of a sub-contracting system.

Strike of Bartenders at Fort William.

Fifty-two bartenders went on strike the first of the month for increased rates of pay and recognition of the union. After the bartenders were out two days the thirteen employers affected acceded to the union's demands, and signed an agreement presented by the union. The men thereupon returned to work.

Strike of Painters and Paperhangers at Brantford.

Thirty painters and paperhangers at Brantford went on strike the first of the month for an increase in wages from twenty-five and thirty cents per hour to thirty and thirty-five cents an hour.

Labour Gazette, July, 1914.

Strike of Carpenters at London.

On June 1 about 200 carpenters in the employ of most of the large contractors in the city went on strike for a minimum wage of 40 cents per hour, a nine-hour day, union recognition, and re-establishment of the apprentice system.

Strike of Electrical Workers at Hamilton.

On June 27 some fifty-two linemen and wiremen in the employ of the Hamilton Hydro-Electric Commission discontinued work owing to being refused an increase in wages from thirty-seven cents per hour to forty cents per hour.

Strike of Sheet Metal Workers at Toronto.

Sheet metal workers to the number of 123, employed by the A. B. Ormsby Company, Limited, went on strike on June 26 owing to the employment by the company of carpenters to hang doors made of steel trim and finished to represent mahogany. The sheet metal workers claimed that this was work which should have been given to them.

Labour Gazette, August, 1914.

Strike of Trunk Makers at Toronto.

Thirty-five trunk makers in the employ of the M. Langmuir Manufacturing Company of Toronto, Limited, went on strike July 7th, owing to the laying off by the company of a number of men, the reason given by the company for so doing being slackness in trade. Among the laid off men were a number of union men,

and the union claimed its members were being discriminated against. The company claimed that they had no objection to union men, and were prepared to take on any of the strikers as soon as trade warranted this course.

Labour Gazette, November, 1914.

Strike of Moulders at Owen Sound.

Eighteen employees of the Canadian Heating and Ventilating Company, Owen Sound, struck work on October 6th on account of the firm reducing wages ten per cent. The men claimed there was an unwritten understanding that there would be no decreases or increases this year. No settlement of the strike was reported to the Department at the end of the month.

BRITISH LABOUR NEWS

Changes in Wages.

The total number of workpeople whose rate of wages was reported as being changed in the first six months of 1914 was 559,055, as compared with 1,379,819 in the corresponding period of 1913. Of this number all received net increases with exception of 373,708 workpeople, who had an upward and a downward change which left their wages at the same level as at the beginning of the year.

The total number of workpeople whose rates of wages were reported to have been changed in 1914 was 834,240. Of these, 407,230 received a net increase of £40,210 per week, and 404,960 sustained a net decrease of £35,148 per week. The remaining 22,050 workpeople had upward and downward changes which left their wages at the same level at the end as at the beginning of the year.

Changes in Hours.

The total number of workpeople reported as affected by changes in hours of labour in the first six months of 1914 was 27,220. the aggregate amount of reduction being 67,235 hours per week.

The changes in hours of labour taking effect in 1914 affected 79,135 workpeople. Of these, 78,689 had their hours reduced, and the net amount of the aggregate reduction was 262,153 hours per week.

Trade Disputes.

The number of disputes in 1914 (973) has been exceeded only once in the past 21 years, viz., in 1913, while the number of workpeople involved (446,205) and the aggregate duration in working days of all disputes in progress (10,104,700), though less than in 1911, 1912 and 1913, were all above the average of preceding years.

Lead and Other Poisoning.

During the first six months of 1914 there were 298 cases and 20 deaths from lead and other poisoning and anthrax in factories and workshops, as compared with 330 cases and 16 deaths in the corresponding period of 1913. There were also 110 cases and 18 deaths from lead poisoning among painters and plumbers, as compared with 135 cases and 21 deaths in 1912.

During the year 1914 there were 511 cases and 36 deaths from lead and other poisoning and anthrax in factories and workshops as compared with 625 and 34 deaths in the corresponding period of 1913. There was also 241 cases and 39 deaths from lead poisoning among painters and plumbers as compared with 291 cases and 37 deaths in 1913.

APPENDIX

Municipal Returns.

Sault Ste. Marie, C.—Openings for all kinds of woodworking industries. Number of buildings erected, 190; cost $385,036. Amount expended on permanent improvements, $132,108. Amount expended on sanitation, $40,632. C. J. Pim, City Clerk, Sault Ste. Marie.

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